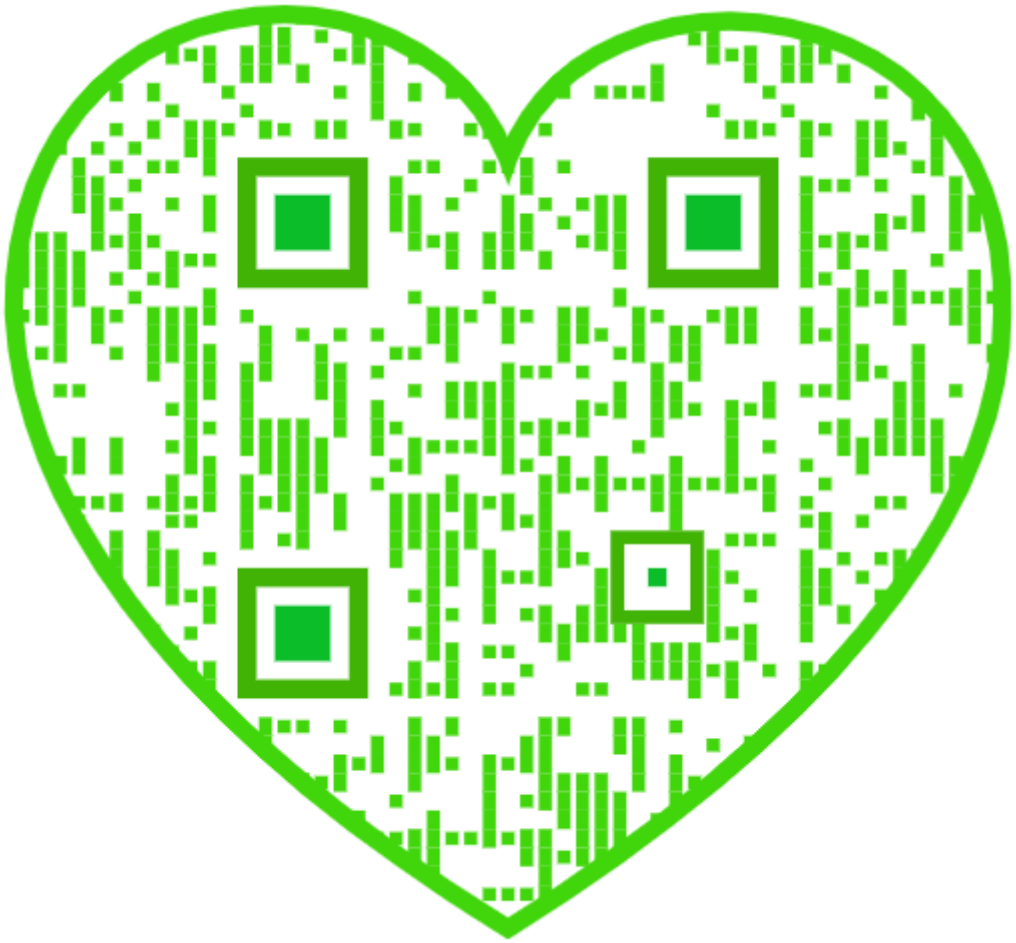

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THE ELEMENTS OF HYPNOTISM

THE INDUCTION, THE PHENOMENA, AND THE PHYSIOLOGY OF HYPNOSIS

BY

RALPH HARRY VINCENT

WITH SEVENTEEN ILLUSTRATIONS

SECOND EDITION, REVISED AND ENLARGED

BRITISH ASSOC. CANCELLED

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PREFACE

In preparing this edition the opportunity has been taken to make extensive revision: the progress of knowledge has enabled me to give less space to the combating of the various superstitions connected with the subject, so that I have been able to deal somewhat more adequately with important matters. The chapter on the "Physiology of Hypnosis" is entirely new, and the method of investigation here suggested is the one which appears to be most likely to yield results of permanent value; accordingly considerable attention has been devoted to this aspect of the subject. Considerations of space have only allowed me to indicate the main outlines of the principles adopted, but the field of study is easily capable of amplification by the serious student. As an endeavour has been made to show reason for differing materially from the teaching of any of the accepted schools of physiological psychology, I cannot expect these conclusions to be received without criticism; nevertheless, they have not been advanced without consideration; and,

whilst, doubtless, there are many faults in the manner of representation, I think that the essential principles here laid down are sound ones, since they are, as far as possible, the results of experimental observation. The methods of introspection and purely theoretical speculation have not been relied on, though, where experiment is not possible, I have endeavoured to indicate the theory which seems suggested by the phenomena.

I am indebted to Mr Lindesay Poulter for the trouble he has taken in seeing this edition through the Press.

R. H. V.

September 1897.

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CHAPTER I

THE GENESIS OF HYPNOTISM

Its early beginnings—Egypt—Greece—Rome—The Ebers Papyrus —St Justin—Asclepiades—Solon—Martial—Pliny—Tacitus—Suetonius—St Augustine—The royal touch—Paracelsus—Pomponatius—Glocenius—Kircher—Van Helmont—Digby—Maxwell—Burggrav—Wirdig—Fludd—Helinotius—Mesmer—Vienna—Hehl—Academy of Berlin—Academy of Bavaria—Dr Osterwald—Prof. Baur—Paris—Mesmer's propositions—d'Eslon—Treaties with the Academy of Science and the Royal Society of Medicine—The Commission of Investigation appointed—Their reports—The Report of Jussieu—Puységur—Buzancy—Pététin—The Abbé Faria—Deleuze—Germany—Dr Wolfart—Bertrand—Noizet—Du Potet—Georget—Rostan—Foissac—New Commission appointed—Their report—Further Commission and its report—Burdin *jeune*—Pigeaire—Resolution of the Academy of Science—Schopenhauer—The abuses of magnetism—Père Lacordaire—Du Potet—Elliotson—Braid—La Fontaine—Braid's experiments—Azam—Liébeault—Dumont—Charcot—Bernheim—Nancy—Beaunis—Liégeois—The two schools of hypnotism—Its progress—Kingsbury—Bramwell—Tuckey—Myers—Gurney.

THE science of hypnotism has been evolved from such a labyrinth of idle superstition and wild speculation that even those keenly interested in the development of human knowledge have held aloof from a subject which apparently presents so entangled a maze of insoluble riddles.

In the long course of its history it has been the frequent prey of the unscientific investigator, and indeed almost all the quacks, at one time or another, have endeavoured to make some use of it.

Its peculiar attraction for these men lay in the fact that the ordinary run of mankind knew nothing of the hypnotic state, and in the narrowness of their philosophy were wont to attribute to the supernatural or the unknowable all that they, in their ignorance, could not appreciate or fathom. Many, however, of these unscientific advocates were painfully in earnest, and the study of the subject was still making headway when the professional entertainer, the charlatan, the juggler, the trickster, laid their hands on the much-suffering science.

No sooner had the showman's heart been gladdened by his latest "find," than he proceeded to add some "business" that his "entertainment" might be still more effective, and in a space as short in time as it was dire in its effects, "mesmerism" became a bye-word for all that was low and contemptible.

To those, therefore, who would have a clear knowledge of what hypnotism is and what it is not, a study of its history is a necessity; but since to many the suspension of the judgment while wading through the tale of exploded ideas may not be an easy matter, it may be well for some to read first the later chapters dealing with the modern theory of hypnotism, and then to recur to these first

ehapters for an indieation of the various superstitions eonneeted with the subjeet.

It were unlikely that a definite eondition of the human mind eould for long be entirely unknown to all, and a study of aneient writings shows that however eurious the aneient ideas may have been, yet the state itself had been observed in the earliest times. Thus the history of hypnotism begins almost in fable. Methods were in use amongst the Egyptians, the Greeks, and the Romans, whieh present a striking similarity to the means adopted by modern hypnotists. In the British Museum there is a bas-relief taken from a tomb in Thebes; the "subjeet," as he would be termed in modern phraseology, is sitting down, whilst at a short distanee from him a man is standing with his hand uplifted and evidently about to "pass" over his patient. The goddess Isis on the zodiae of her temple at Denderah is represented as making the same "passes." Ths earliest Greek physieians were in the habit of using proeesses having a strong resemblanee to the "eutaneous irritations" of Heidenhain.[1]

The *Ebers Papyrus*,[2] whieh gives us some aeeount of the medieal methods praetised in Egypt prior to 1552 B.C., mentions the laying of hands on the head of the patient as a part of the treatment.

[1] "Hypnotism." London, 1892.
[2] Dr Albert Moll (Berlin). "Hypnotism," p. 3.

Even the "clairvoyant" theories of the mesmerists seem to have an history, since probably the early soothsayers and oracles relied largely on the hypnotic states; and the acuteness and subtlety which the faculties often gain in deep states of hypnosis would enable the subjects to speak with a foresight and wisdom calculated to excite the admiration and reverence of those who made use of their services.

St Justin says—"The Sibyls spoke many great things with justice and truth, and that when the instinct which animated them ceased to exist, they lost the recollection of all they had declared." Asclepiades was in the habit of putting frenzied persons to sleep by rubbing, and when these frictions were prolonged, the patient was plunged in a deep lethargy.

One of the earliest and at the same time most striking references to the use of some form of nerve stimulation as a curative agent occurs in *Solon*.[1]

> "πολλάκι δ' εξ ὀλίγης ὀδύνης μέγα γίγνεται ἄλγος
> κοὐκ ἄν τις λύσαιτ ἤπια φάρμακα δούς
> τὸν δὲ κακαῖς νούσοισι κυκώμενον ἀργαλέαις τε
> ἁψάμενος χειροῖν ἁῖψα τίθησ' ὑγιῆ."

---

[1] "ὑποθηκαι εἰς ἑαυτον," ll. 59-62. Stanley (*History of Philosophy*, 1666) gives the following translation :—

> "The smallest hurts sometimes increase and rage
> More than all art of physic can assuage ;
> Sometime the fury of the worst disease
> The hand, by gentle stroking, will appease. '

Martial,[1] touching apparently on some luxurious refinement, has a curious reference to the subject. Pliny[2] refers to the method, which will be described later on, of "fascination."

The author of the "Denarium Medicum" writes —"Fuerunt ante Hippocratem multi viri docti qui nulla prorsus medicina corporea usi sunt sed sola spiritus et animae facultate."

Tacitus[3] and Suetonis[4] testify to the cures performed by the Emperor Vespasian.

Finally, St Augustine[5] tells of a priest whom he knew and who could reduce himself to a state not to be distinguished from death.

Everyone has heard of the cures due to the "royal touch." Numerous cures were effected in this manner by the early kings of France, and the "touch" was still in vogue in Queen Anne's time.

[1] "Percurrit agili corpus arte tractatrix
Manumque doctam spargit omnibus membris."
Book III. Ep. 82.

[2] "Esse adjicit Isigonus, in Triballis et Illyriis qui visa quoque effascinent, interimantque quos diutius intereantur, iratis praecipue oculis: quod eorum malum praecipue sentire puberes. Notabilius esse quod pupillas binas in singulis oculis habeant. Hujus generis et feminas in Scythia, quae vocantur Bithyae, prodit Apollonides: Philarchus et in Ponto Thibiorum genus multosque alios ejusdem naturae; quorum notas tradit in altero oculo geminam pupillam in altero equi effigiem," etc. *Hist. Nat.* lib. viii. c. 2.—Pliny also recommends breathing on the forehead as a means of cure. *Hist. Nat.* lib. xxviii. c. 6.

[3] Hist. iv. 81. [4] Vespas. vi.; 5, 6.

[5] *De Civitate Dei.* Migne. Patres Latini T. 41; St Aug. vol. vii. p. 432, 3.

It seems to have been first exercised by the Scandinavian princes, and particularly by St Olaf, who is supposed to have reigned from 1020 to 1035.[1] Thus we notice in various times a number of phenomena which may, at first sight, strike the reader as but distantly connected with each other; the nature and extent of their connection may be more apparent in the later chapters.

How far the Egyptians, Persians, Greeks, Romans knew of the scientific import of these phenomena, and how much they knew seems impossible to decide. We have but the bare record of a number of isolated facts; there seems to be no evidence of any common method or principle. It is not improbable, since many of the phenomena were connected with the oracles or with the most learned physicians, that the people either took no trouble to look for any explanation, or attributed the results to supernatural agency. The first traces of any system appear towards the end of the Middle Ages, and this system grew out of the doctrines of astrology. Some of the famous men of the time were at work on the subject, and notwithstanding the strange doctrines advocated in most of their writings, the student who ventures on them will find them curiously interesting, though lengthy and ponderous. Prominent amongst these writers are Theophrastus Paracelsus, Petrus Pomponatius,[2] Rod, Glocen-

[1] "History of Scandinavian Kings." Snorro Sturlurson.

[2] *De Incantationibus.* Basil, 1657.

ius,[1] Athanasius Kircher,[2] Van Helmont,[3] Sir Kenelm Digby,[4] Gul. Maxwell,[5] J. G. Burggrav,[6] Sebastian Wirdig,[7] and others, including Fludd and Helinotius.

All these men, in various ways, attempted to demonstrate the existence of an universal magnetic force by which the reciprocal action of bodies, in general, upon each other, and particularly the phenomena of the human body and mind, were to be explained. The human will was capable of producing an effect upon the minds and organisms of other persons. Pomponatius and Van Helmont were the two most systematic upholders of this view. Pomponatius, professor of philosophy at Padua, was born at Mantua in 1462, and died in 1525. He sought to prove that sickness and disease were curable by means of the "magnetism" existing in

[1] *Tract. de Magnet. vuln. curat.* Marburgi, 1608.

[2] Athanasius Kircher, S. J., one of the greatest scholars of the Middle Ages. *Magnes sive de Arte Magnetica.* Coloniae, 1643. Magneticum Naturæ Regnum. Amst. 1667, &c., &c. For complete list of his works see "Bibliothèque de la Compagnie de Jésus." (Brussels, 1890.) See Appendix.

[3] Van Helmont. *De Magnet. Vuln. . . . curatione.* Paris, 1621, &c.

[4] Sir Kenelm Digby. "Of the cure of wounds by the powder of sympathy." London, 1660.

[5] Gulielmus Maxwell. "De Medicina Magnetica." Frankf. 1679. See Appendix.

[6] J. G. Burggrav. "Cura Morborum Magnetica qua vera Theophrasti (Paracelsi ?) Mumia significatur." 1611.

[7] Sebastian Wirdig. "Nova Medicina Spirituum." Hamb. 1673.

each person. "When those who are endowed with this faculty operate by employing the force of the imagination and the will, this force affects their blood and their spirits, which produce the intended effects by means of an evaporation thrown outwards."[1]

Health, according to the same writer, may be communicated to a sick person by the same means.[2]

John Baptist van Helmont was born at Brussels in the year 1577. He was educated for the medical profession, but spent his life in chemical researches. The discovery of laudanum, of the spirit of harts-horn, and of the volatile salts are due to him; he also discovered the existence of the aëriform fluids, to which he gave the name *Gas*, a name they still retain. He died in 1644.

His book was intended partly as an answer to Glocenius, an earlier writer, who had advocated the doctrines of magnetism, but not in a manner agreeable to Helmont, and partly as a reply to Fr. Robert, a Jesuit, who had contended that the cures performed by means of this magnetism were due to diabolical agency.

1 "Possibile est apud me quod homo habeat talem dispositionem qualem diseimus. Sie eontingit tales homines qui habeant hujus-modi vires in potentia, et per vim imaginativam et desiderativam cum aetu operantur, talis virtus exit ad aetum; et afficit sanguinem et spirituum qui per evaporationem petunt ad extra et produeunt tales effeetus."—Cap. iv. p. 44.

2 "Incredible non est, etiam sanitatem posse produei ad extra ab anima talitse imaginante et desiderante de aegritudine."—Cap. iv. p. 51.

He makes short work of his opponents [1] :—

"Magnetism is an universal agent; there is nothing new in it but the name; and it is a paradox only to those who are disposed to ridicule everything, and who ascribe to the influence of Satan all those phenomena which they cannot explain."

He defines magnetism as [2] "that occult power which bodies exert over each other at a distance, whether by attraction or repulsion."

Wirdig sums up his own position in few but incisive words :—"Totus mundus constat et positus est in magnetimo, omnes sublunarium vicissitudinem fiunt per magnetismum, vita conservatur magnetismo; interitus omnium rerum fiunt per magnetismum."

It is noticeable that the theories of magnetism gain force and precision in each successive writer. Paracelsus and Glocenius rather hint at than advocate the doctrine of Magnetism, but Wirdig takes up a much more decided position; whilst Maxwell's "spiritus vitalis" indicates a great development, and, in fact, was the legitimate precursor of Mesmer's doctrine of the "universal fluid."

In accordance with the spirit of this ecclesiastical age they made no effort to prove their conclusions —the more impossible the theory the more vehe-

[1] "Magnetismus, quia passim viget, praeter nomen, nil novi continet; nec paradoxus nisi iis qui cuncta derident et in Sataniae dominum ablegant quae cunque non intelligant."

[2] "Sic vocitamus eam occultam coaptationem qua absens in absens per influxum agit sive trahendo vel impellendo fiat."

mently was it advoeated; thus their works are full of the fruitless diseussion of untenable premisses. Still it is not diffieult to be wise after the event, and a study of the reports of the Psyehieal Researeh Soeiety,[1] the works of Haek Tuke,[2] and Carpenter,[3] together with those of Kireher, Van Helmont, and others, affords in some respects a demonstration of the relations of later psyehology to its embryonie form.

In the middle of the eighteenth eentury another figure comes on the seene. Friedrieh Anton Mesmer was born on the banks of the Rhine, in a small town called Stein, on the 5th of May 1734. He attained his doetor's degree at Vienna, where he studied prineipally under Professor Van Swieten and Professor Haen. He chose for his thesis[4] on taking his degree—"The Influenee of the Planets on the Human Body."

Whilst at Vienna, Mesmer seems to have been

[1] See Reports of Committee on Mesmerism; also papers by Myer and Gurney.

[2] "Iufluenee of the Mind upon the Body," etc.

[3] "Mental Physiology."

[4] Some writers have remarked the strangeness of sueh a thesis as Mesmer's being aeeepted. Van Swieten was world-renowned at the time, but he does not seem to have been altogether orthodox, if we may judge from the following title-page of a book dedieated to him:—"Androphili Aselepiadei Liber, in quo pauea explieantur, quorum scitu sanitas eonservari et vita Hominis, *ab ignorantia medicorum* poterit esse secura." Neostadii in Austria, 1747.

The Editor's name does not appear, but the *Imprimatur* given by the Bishop is interesting, and shows the esteem in whieh Vau Swieten was held at the time:—"Cum praesens opuseulum eui

attracted still more to the whole question of Magnetism by witnessing the wonderful "cures" performed by Father Hehl,[1] a Jesuit. These cures were supposed to be due to the subtle influence or fluid of magnetism, which was imparted to the patients from steel plates and magnets specially prepared for the purpose.[2]

titulus: 'Androphili Asclepiadei liber, in quo pauca explicantur, quorum scitu sanitas conservari et vita hominis ab ignorantia medicorum poterit esse secura'; nihil contineat, quod Fidei Orthodoxæ aut bonis moribus adversetur, imo a Clarissimo Viro, Gerh. van Swieten Sacrae Caesareae Regiaeque Majestatis Archiatro pulcherrimo exornatum fit encomio; hinc non tantum facultatem damus, ut prelo mandetur, sed et dignissimum censemus, quod in lucem prodeat. In quorum fidem, etc. Datae Neostadii in Austria ex Curia Episcopali die 23. Junii, Anno 1747.—FERDINANDUS EPISCOPUS."

[1] Maximilian Hehl, Professor of Astronomy at Vienna, was born at Chemnitz in Hungary in the year 1720. During the year 1745 and 1746 he assisted Father J. François, the head of the Jesuits' observatory at Vienna. He then went to Clausenberg in Transilvania to teach mathematics, and was recalled some years afterwards to Vienna, where he became the chief astronomer. From 1757 to 1786 he published yearly Ephemerides. At the request of Count Bachoff (the Danish Ambassador at Vienna), he set out for Lapland in April 1768 to observe the transit of Venus, and having accomplished his object, returned to Vienna in 1770. He died on the 14th of April 1792. Amongst his works are:—

"Tabulae Solares N. L. de la Caille, cum suppl. reliquar tabular." 1763.

"Tabulae lunares Tob. Mayer. cum suppl. W. Cassini de Lalande, et suis." 1763.

"De transitu Veneris ante discum solis die tertio," Jun. 1769; Wardachusii in Finmarchia observato, 1770. "De Paralaxi solis ex observatione transitus, Veneris anni, 1769, 1773," etc.

[2] Upon the value of the mineral magnet in the cure of sickness and disease numerous early authors had written. Its use seems to

Having investigated the matter, and having satisfied himself of the genuineness of the cures, he entered upon a series of independent experiments. On one occasion Mesmer had bled a patient, and was getting the "magnetic tractors" to heal the wound, when he accidentally passed his hand over the cicatrix, and was astonished to find that the pass of his hand had done what had hitherto been effected only by means of the magnets.

This shed a new light on the phenomena, and in 1775 Mesmer issued a circular letter, addressed, in the first place, to the leading academies. In this he maintained the existence of Animal Magnetism, by means of which men could mentally influence each other, and he drew a strong distinction between the magnetism which he termed animal and the magnetism of metals. The Academy of Berlin was the only one that replied to his letter, and its answer was not favourable.

About this time, however, the Academy of

have been recommended by Galen and Dioscorides. The following are some of the chief works :—

Ludwig. "Dissert. de Magnetismo in corpore humano." Leips. 1772.

Unzer. "Beschreibung der mit dem Küntslichen Magnet angestellten Versuche." Altona, 1775.

Heinsius. "Beyträge zu meinen Versuchen welche mit künstlichen Magneten in Verschiedenen Krankheiten angestellt worden." Leips. 1776. "Sammlung der neusten gedruckten und geschriebenen Nachrichten von Magneteuren." Leips. 1778. "Historia Trismitoniei quadraginta fere septimarum a Philiatro de Woeher curati." Freiburg, 1778.

Bavaria nominated him as a member. The publication of reports of Mesmer's cases in the newspapers roused Vienna to a high pitch of excitement. One of the directors of the Academy of Science at Munich, a Doctor Osterwald, said that he had been cured of paralysis; another professor, named Baur, stated that he had been completely cured of ophthalmia. Not only the people but the court were to be seen at his levées and his séances. Mesmer at first cured only by contact, but he put forward later the theory that various objects of iron, wood, etc., were capable of receiving the necessary magnetism, and he used in consequence various mechanical means for the conveyance of the fluid.

Vienna had indeed been roused by Mesmer's work, but from the first he was the object of great enmity. This hostility was largely due to the vested interests of the faculty which seemed at stake; but Mesmer himself was anything but conciliatory, and in 1778 he left Vienna and went to Paris.

Binet and Féré[1] state that, "obliged to quit Vienna, in consequence of some adventure not clearly explained, Mesmer came to Paris." This rumour of some scandalous adventure seems to have been industriously circulated by Mesmer's many enemies as his reason for leaving Vienna, till by its constant repetition it gained general credence, but there seems no reason to suppose that the cause of his leaving was anything more than the general

[1] Op. cit. p. 4.

hostility manifested against him. In Paris, Mesmer constructed his famous "baquet" or tub. This seems to have been a wonderful piece of apparatus. Deleuze describes it as follows:—

"In the centre of a large room stood an oak tub, four or five feet in diameter and one foot deep; it was closed by a lid made in two pieces, and enclosed in another tub or bucket. At the bottom of the tub a number of bottles were laid in convergent rows so that the neck of each bottle turned towards the centre. Other bottles filled with magnetised water, tightly corked down, were laid in divergent rows with their necks turned outwards. Several rows were thus piled up, and the apparatus was then said to be at 'high pressure.' The tub was filled with water, to which was sometimes added powdered glass and iron filings. There were also some dry tubs, that is, prepared in the same manner, but without any additional water. The lid was perforated to allow of the passage of movable bent iron rods, which could be applied to the different parts of the patients' bodies. A long rope was also fastened to a ring in the lid, and the patients placed this loosely round their limbs. No diseases offensive to the sight, such as sores, wens, or deformities, were healed. The patients then drew near to each other, touching hands, arms, knees, or feet. The handsomest, youngest, and most robust magnetisers held also an iron rod, with which they touched the dilatory or refractory patients. The rods and ropes

had all undergone a preparation, and in a very short space of time the patients felt the magnetic influence. The women, being the most easily affected, were almost at once seized with fits of yawning and stretching, their eyes closed, their legs gave way, and they seemed to suffocate. In vain did musical glasses and harmonies resound, the piano and voices re-echo, these supposed aids only seemed to increase the patients' convulsive movements. Sardonic laughter, piteous moans, and torrents of tears burst forth on all sides. The bodies were thrown back in spasmodic jerks, the respirations sounded like death rattles, the most terrifying symptoms were exhibited. Then suddenly the actors of this strange scene would frantically or rapturously rush towards each other, either rejoicing and embracing or thrusting away their neighbours with every appearance of horror.

"Another room was padded, and presented a different spectacle. There, women beat their heads against the padded walls or rolled on the cushion-covered floor in fits of suffocation. In the midst of this panting, quivering throng, Mesmer, dressed in a lilac coat, moved about, extending a magic wand towards the least suffering, halting in front of the most violently excited, and gazing steadily into their eyes, while he held both their hands in his, bringing the middle fingers in immediate contact, to establish the communication. At another moment he would, by a motion of open hands and extended

fingers, operate with the 'great current,' crossing and uncrossing his arms with wonderful rapidity to make the final passes." Bailly, who was later the reporter to one of the scientific commissions which were appointed to examine the Mesmeric theories, was a witness of these scenes, and he also has left an account of them. The year 1779 is important as the one in which Mesmer published a paper,[1] claiming that he had discovered a principle capable of curing every disease. He sums up in twenty-seven propositions :—

1. There is a reciprocal action and reaction between the planets, the earth, and animate nature.
2. The means by which this influence acts and reacts is a fluid universally diffused, so continuous as not to admit of a break, incomparably subtle and susceptible of receiving, increasing, and communicating all motor disturbances.
3. This reciprocal action is subject to mechanical but as yet unknown laws.
4. The reciprocal effects resulting from this action may be considered as flux and reflux.
5. This reflux is more or less general, more or less special, more or less complex, according to the nature of the causes which determine it.
6. It is by this action, the most universal which

[1] Memoire sur la découverte du Magnétisme animal. Paris, 1779.

occurs in nature, that the exercise of active relations between the planets, the earth and its constituent parts, takes place.

7. The properties of matter and of organic substance depend on this action.
8. The animal body experiences the reciprocal effects of this agent, and is directly affected by its insinuation into the substance of the nerves.
9. Properties are displayed analogous to those of the magnet, particularly in the human body, in which diverse and opposite poles are likewise to be distinguished, and these may be communicated, changed, destroyed, and reinforced. Even the phenomenon of declination may be observed.
10. This property of the human body, which renders it susceptible of the influence of the planets and of the reciprocal action of those which environ it, manifests its analogy with the magnet, and this has led me to adopt the term "animal magnetism."
11. The action and virtue of animal magnetism, thus characterised, may be communicated to other bodies inanimate or animate.
12. This action and virtue may be strengthened and diffused by such bodies.
13. Experiments show that there is a diffusion of matter, subtle enough to penetrate all bodies without any considerable loss of energy.

14. Its action takes place at a remote distance, without the aid of any intermediary substance.
15. It is, like light, increased and reflected by mirrors.
16. It is communicated, propagated, and increased by sound.
17. This magnetic virtue may be accumulated, concentrated, and transported.
18. I have said that animated bodies are not all equally susceptible; in a few instances they possess so opposite a property that their presence is sufficient to destroy all the effects of magnetism upon other bodies.
19. This opposite virtue likewise penetrates all bodies; it also may be communicated, propagated, accumulated, concentrated, and transported, reflected by mirrors, and propagated by sound. This does not merely constitute a negative, but a positive opposite virtue.
20. The magnet, whether natural or artificial, is like other bodies susceptible of animal magnetism, and even of the opposite virtue; in neither case does its action on fire or on the needle suffer any change, and this shows that the principle of animal magnetism essentially differs from that of mineral magnetism.
21. This system sheds new light upon the nature of fire and of light, as well as on the theory

of attraction, of flux and reflux, of the magnet and of electricity.

22. It teaches us that the magnet and artificial electricity have, with respect to diseases, properties common to a host of other agents presented to us by nature, and that if the use of these has been attended by some useful results, they are due to animal magnetism.

23. These facts show, in accordance with the practical rules I am about to establish, that this principle will cure nervous diseases directly, and other diseases indirectly.

24. By its aid the physician is enlightened as to the use of medicine, and may render its action more perfect, and he can provoke and direct salutary crises so as to have them completely under his control.

25. In communicating my method, I shall, by a new theory of matter, demonstrate the universal utility of the principle I seek to establish.

26. Possessed of this knowledge, the physician may judge with certainty of the origin, nature, and progress of diseases, however complicated they may be; he may hinder their development and accomplish their cure without exposing the patient to dangerous and troublesome consequences, irrespective of age, temperament, and sex. Even women in a

state of pregnancy and during parturition may reap the same advantage.

27. This doctrine will finally enable the physician to decide upon the health of every individual, and of the presence of the diseases to which he may be exposed. In this manner the art of healing may be brought to absolute perfection.

These propositions, highly vague and mystic in their language, possess some interesting features indicating the constant attempt of ignorance to harmonise the results of observation with its preconceptions.

Mesmer's statements and methods had, however, struck the popular imagination in a remarkable manner, and it became necessary for measures to be taken which might settle some of the questions so hotly disputed. Accordingly a commission was appointed to inquire into and report upon the whole question. There were in fact two commissions. The one, composed of members of the Faculty of Medicine, of the Academy of Sciences, and some well-known men, such as Franklin and Lavoisier; the other taken from the members of the Royal Society of Medicine. The reports of both were unfavourable to Mesmer's claims. The two commissions presented elaborate reports, giving a detailed account of their meetings and experiments. Owing to their great length it is impossible to

quote them in full, but as it is necessary that the reader should have a clear view of the nature of the questions in dispute, and of the position assumed by the various scientific men of the time, the conclusions are given below.

The student will find the full text in the printed reports published, and a valuable historical commentary on this is supplied by the work [1] of Burdin and Dubois, which also contains the reports of the later commissions.

The commission of the Academy of Science was the first to publish its report, and its conclusion is as follows [2]:—

"The commissioners have ascertained that the animal magnetic fluid is not perceptible by any of the senses; that it has no action, either on themselves or on the patients subjected to it. They are convinced that pressure and contact effect changes which are rarely favourable to the animal system, and which injuriously affect the imagination. Finally, they have demonstrated by decisive experiments that imagination, apart from magnetism, produces convulsions, and that magnetism without

[1] Histoire Académique du Magnétisme Animal accompagnée de notes et de remarques critiques sur toutes les observations et experiences faites jusqu'a ce jour par C. Burdin *Jeune* et Fréd. Dubois (d'Amiens). Paris, 1841.

[2] Rapport des Commissaires de la faculté de Medecine et de l'académie des Sciences chargés par le Roi de l'examen du Magnétisme animal. Paris, 1784.

imagination produces nothing. They have come to the unanimous conclusion with respect to the existence and utility of magnetism, that there is nothing to prove the existence of the animal fluid; that this fluid, since it is non-existent, has no beneficial effects; that the violent effects observed in patients under public treatment are due to contact, to the excitement of imagination, and to the mechanical imitation which involuntarily impels us to repeat that which strikes our senses. At the same time, they are compelled to add, since it is an important observation, that the contact and repeated excitement of the imagination which produced the crises may become hurtful; that the spectacle of these crises is likewise dangerous, on account of the imitative faculty, which is a law of nature; and consequently that all treatment in public in which magnetism is employed must in the end be productive of evil results."

(Signed) "B. Franklin, Majault, Le Roy, Sallin, Bailly, D'Arcet, De Bory, Guillotin, Lavoisier."

"Paris, 11*th of August* 1784."

From the report it will be seen that the commissioners considered the imagination responsible for the phenomena they had been appointed to examine, and denied altogether the existence of the force to which Mesmer had given the name animal magnetism.

In addition to this public report the commissioners presented a private report to the king, in which they referred to the objectionable features of the séances, and insisted strongly on the moral danger of the practice of animal magnetism.

The Royal Society of Medicine issued their report on the 16th of August, and their conclusions agreeing in the main with that of the Academy of Sciences and the Faculty of Medicine were as follows[1]:—

It follows from the first part of our report—

1. That the so-called *animal magnetism*, as it has been put forth in our days, is an ancient system, praised in past centuries, and then forgotten.
2. That the advocates of animal magnetism, either those who invented this system or those who have revived it amongst us, have not been able in the past, nor can they now give any proof of the existence of the unknown agent, or of "the fluid" to which they have ascribed certain powers and effects, and that consequently the existence of this agent is gratuitously assumed.
3. That what has been called *animal magnetism*, reduced to its proper value by the examination and analysis of facts, is the art of causing

[1] Rapport des Commissaires de la Société Royale de Medecine. Paris, 1784.

to fall into convulsions by the touching of the most irritable parts of the body, and by the friction exercised on these parts, very sensitive persons, after they have been prepared for this result by multiplied and concomitant causes, which can be varied at will, and of which some alone are capable of producing most violent convulsions in certain cases and in certain subjects.

4. We have begun the second part of our report by remarking that if the *so-called animal magnetism* vaunted in the last century had really been useful, the use of it would have been established and perpetuated.

5. We have shown that it is by an error in the use of terms that the effects produced by *animal magnetism* have been called *crises;* that between these which are the means nature employs to heal, and the effects of the so-called magnetism, there is no relationship except in the similarity of names, whilst all the essential and constituent conditions are diametrically opposed.

6. We have detailed the numerous and serious dangers to which we are exposed by the use of the *so-called animal magnetism;* we have insisted on the evil effects which are to be feared from the convulsions it excites and the evacuations it causes.

Consequently we are of opinion—

1. That the theory of *animal magnetism* is a system absolutely without proof.
2. That this so-called method of healing, reduced to the irritation of sensitive parts, to imagination and its effects, is at least useless to those in whom neither evacuations nor convulsions follow, and that it may become dangerous by provoking and carrying to a too high degree the tension of fibres in those whose nerves are highly sensitive.
3. That it is very harmful to those in whom it produces effects which have been wrongly called *crises;* that it is all the more dangerous as the so-called *crises* are stronger or the convulsions more violent and the evacuations more abundant, and that there are many natures in whom the consequences may be fatal.
4. That the treatment in public by the process of *animal magnetism* adds to all the drawbacks mentioned above that of exposing a large number of otherwise well-constituted persons to contract a spasmodic or convulsive habit, which may become the source of the greatest evils.
5. That these conclusions must extend to all that is now presented to the public under the name of *animal magnetism,* since the apparatus and

effects being everywhere the same, the inconvenience and dangers to which it exposes persons deserve everywhere the same attention. (Signed) POISSONIER, CAILLE, MANDUYT, ANDRY.

PARIS, 16*th of August* 1784.

These reports, however conclusive they might otherwise have been, were rendered less useful by the withdrawal of Laurent de Jussieu, the great botanist, from the commission of the Royal Society of Medicine. Jussieu had admittedly examined the experiments with extraordinary care and thoroughness, and found himself unable to agree with his colleagues. He published a separate report with the object of showing that he had produced certain effects which could not be explained by imagination ; and he stated, as the result of his observations, that a sensible action was produced by friction, by contact, and even by proximity. He did not adopt the term animal magnetism, but attributed the influence to " animal heat," or as he termed it later, " animalised electric fluid."

He discussed the subject elaborately in his report,[1] and his conclusion was as follows :—

" The theory of magnetism cannot be admitted until it is developed and supported by solid proof. The experiments made to verify the existence of the

[1] Rapport de l'un des commissaires chargés par le Roi de l'examen du magnétisme animal. Paris, 1784.

magnetic fluid only prove that man produces a sensible action on his fellow by friction, by contact, and more rarely by the mere fact of drawing nearer. This action, attributed to a non-established universal fluid, certainly belongs to the animal heat in bodies, which continually emanates from them, goes sufficiently far, and can pass from one body into another. Animal heat is developed, increased, or diminished in a body by causes either mental or physical; judged by its effects, it shares the properties of tonic medicines, and produces, like them, effects either good or bad, according to the dose and the circumstances under which it is used. A widespread and more intelligent use of this agent will better show its real action and degree of utility. Every doctor may follow the methods he considers advantageous to the treatment of diseases, but on condition that he publishes his methods when they are new or opposed to the ordinary practice. Those who have established, spread, or followed the treatment known as magnetic, and who propose to continue, are therefore bound to reveal their observations and discoveries; and we must proscribe any such treatment the process of which shall not be made known by prompt publication."

"A. L. DE JUSSIEU."

After the report of the commissions, there seemed little temptation for Mesmer to remain in Paris, and he returned to Germany.

He died in Morsburg in 1815, and the Berlin physicians erected a monument over the grave in honour of his memory.

Despite his sensational methods and extravagant assertions, there is good reason to believe that Mesmer was sincere—to the poor he was always indulgent, and he seems to have been actuated by high motives; but, like many enthusiasts, he regarded the facts he had observed as so many proofs of his theories in reference to them—turning the facts to fit the theories *in suo more*. He firmly believed in the "animal magnetism" possessed by himself, and so forcibly did he impress his beliefs on his generation that the term "Mesmerism" with its connoted ideas still has a powerful hold on the popular imagination.[1]

The question was not allowed to drop with the

[1] Besides those already quoted, the following are some of the chief publications of the period on the subject:—

"Supplement aux deux rapports de MM. les commissaires de l'academie et de la faculté de médecine et de la société royale de médecine." Anon., Paris, 1784.

"C'est la réponse la plus sage et la plus coneluante qu'on ait faite aux rapports; elle est rédigée avec une extrême clarté. Il n'y a aucune idée systematique: on n'y aperçoit pas la moindre trace d'exagération ou d'enthousiasme. Je suis surpris qu'elle n'ait pas fait plus de sensation. Il me paroit qu'elle suffit pour démontrer à tout esprit droit l'injustice des attaques dirigées contre le magnétisme et l'efficacité de cet agent." Deleuze. "Histoire Critique du Magnétisme animal." Part ii., p. 59.

"Considérations sur le Magnétisme animal sur la théorie du monde et des êtres organisés," par M. Bergasse. La Haye, 1784.

"La Colosse aux pieds d'argile," par M. Wevillers. 1784.

retirement of Mesmer; but, on the contrary, the greatest interest was manifested in the experiments and observations of his disciples. Prominent amongst these was the Marquis Chastenet de Puységur. Many causes tended towards the progress of magnetism in his hands. It must be admitted that Mesmer had made extremely rash and inconsiderate attacks on every one who would not forthwith join him; and in addition to this unfortunate propensity he seemed to be imbued with an innate love of the mysterious; whilst he must have displeased many who might otherwise

"Traité théorique et pratique du Magnétisme animal," par M. Doppet, docteur en médecine de la faculté de Turin. 1784.

"Observations sur le Magnétisme animal," par M. d'Eslon. Paris, 1780.

"Lettre de M. d'Eslon, docteur-régent de la faculté de médecine de Paris, premier médecin de monseigneur le comte d'Artois; à M. Philip, doyen en charge de la même faculté." La Haye, 1782.

"Lettre sur le Magnétisme animal, ou l'on examine la conformité des opinions des peuples anciens et modernes, des savants et notamment de M. Bailly, avec celle de M. Mesmer et où l'on compare ses mêmes opinions au rapport des commissaires"; adressée à M. Bailly de l'académie des sciences," etc., par M. Galard de Montjoye. Paris, 1784.

"Doutes d'un provincial, proposés à MM. les médecins-commissaires," etc. Lyon, 1784.

The author, according to Deleuze, was M. Servan, "ancien avocat-général au parlement de Grenoble."

"Analyse raisonné des rapports des commissaires," etc., par J. Bonnefoy, membre du collège royal de chirurgie de Lyon. Lyon, 1784.

"Réflexions impartiales sur le Magnétisme animal, faites après la publication du rapport de MM. les commissaires." 1784.

have been attached to him, by his sensational manner of procedure.

None of these faults were present in de Puységur. At Buzancy, he lived on his estate a quiet and retired life, contenting himself with his experiments, and curing those whom he could. To him is due the discovery of the hypnotic stage known as "somnambulism," a condition many fall into, under hypnosis, and in which the most striking experiments may be performed. It will be referred to more fully when discussing the various forms of hypnosis.

De Puységur, as was very natural under the circumstances, wrongly interpreted many of the strange characteristics of this state. At that time the power of the subject to receive "unconscious suggestion" was not known, and, indeed, remained unknown for some long time after.

Ignorance of this led the Marquis to conclude that in the somnambulic state "thought transference," "clairvoyance," and other impossible powers were to be found in the subject.

De Puységur seems to have thought that Mesmer knew of this state, and Dr Moll,[1] whilst admitting that it is doubtful, inclines to the opinion that Mesmer was aware of it. It is difficult to suppose that in the thousands of cases which came under Mesmer's notice there were no patients who fell into the state of som-

[1] *Hypnotism*, p. 7.

nambulism; at the same time, Mesmer thoroughly believed that his own personal and mental influence was a most important factor, and this, with him, might easily have accounted for the phenomena common to the state. It seems quite possible that the idea of a stage, distinct and *sui generis*, never occurred to him.

De Puységur apparently first identified the state in a peasant who was suffering from "inflammation of the lungs." The peasant, by name Victor, was thrown into a quiet sleep free from the convulsions which had generally attended the induction of the state. It was found that he could be made cheerful or sad, to sing or to dance in accordance with the suggestion conveyed to him by the operator.

Guided by the new knowledge, de Puységur at once proceeded to look for similar cases, and to his great delight found many. This time Buzancy was the rendezvous of all the sick; they came in their numbers, and the quiet, humble Marquis soon found himself at his wit's end to know how to attend to the wants of all his patients. The scientific world was better represented than it had been with Mesmer, and it is related that at Buzancy the patients were to be seen quite free from the terrible convulsions and fits which Mesmer induced, enjoying a peaceful and refreshing sleep.[1]

The number of patients increased so rapidly that the plan of Mesmer was resorted to, and de

[1] Details des cures opérées à Buzancy. Cloquet. Soissons, 1784.

Puységur magnetised an elm which was widely known as "Puységur's tree." In this case the operator, however, was frequently in attendance, and it was stated that many cures were effected.

Mesmer's pupil was still a very long way from the truth, but he had made a great advance on his master's system. It is admitted by all that de Puységur was as honest as the day, and no doubt much of the real impression which he created was due to his quiet, disinterested, and more scientific efforts.

It can be easily understood, however, that the super-normal element of the somnambulic stage, which entered into de Puységur's theory, presented great scope for the professional entertainers, of which they were by no means too slow to avail themselves, and the silly and the credulous were greatly imposed upon by these charlatans, who invented the most ridiculous theories, and succeeded in disgusting most sober-minded people. In a large number of semi-educated communities a rage started for the formation of societies devoted to the study and practice of magnetism. They generally took the name of Harmonic Societies, and under their auspices untold wonders were performed *ad libitum*. Pététin's name must be mentioned in passing. He was President of the Medical Society at Lyons, and strongly opposed all the theories of Mesmer. He is noticeable as having been the first to publish an account of the

phenomena known as "transposition of the senses." He brought before the Lyons Society a woman, who, according to his account, could see, hear, feel, smell, and taste by means of the stomach, and also by means of her fingers; several observations of a like nature were made by him. It is still a point of controversy whether this transposition is a physical fact or whether it is due to suggestion, and the increased faculties of the person hypnotised; they who maintain the actual transposition of the senses are, however, very few, and there seems little doubt that it falls under the category of suggestive faculties (see Chap. III.). In 1813 a very striking development, in reality the first sign of a distinct break from the ideas of Mesmer, was introduced by the Abbé Faria who came from India. He claimed, perhaps indefinitely, and with no very clear perception of the change from the waking to the sleeping state, that the hypnotic sleep was due not to magnetism or to any influence possessed by the operator, but to physiological action on the brain — that, in fact, it depended not on the hypnotist, but on the subject. In this year, too, Deleuze published his valuable work on the history of Animal Magnetism.[1]

The advocacy of the magnetic doctrines had not been confined to Paris, though the ever-varying

[1] Histoire critique du Magnétisme animal. J. P. F. Deleuze. 2 vols. Paris, 1813.

course of its fortunes there claims most of the historian's attention. As early as the year 1785 Animal Magnetism had gained ground in Germany.

Throughout, the enquiry was of a much more thorough and scientific nature than at Paris; so much so that the foremost physicians were lecturing at the Universities on the subject. In France, the study of magnetism had been practically left to laymen, and the natural results of such negligence were soon apparent; in Germany the opposite was the case, and many scientific men were engaged in its investigation. By 1800 it had spread to practically every country, and was received in Denmark and Russia with much enthusiasm.

The Prussian Government (1812) commissioned Dr Wolfart to visit Mesmer and report on the subject. He returned a zealous supporter of Magnetism, using it in his treatment, and lecturing on the subject at the Berlin University.

In all these countries, however, Magnetism led a quiet, sober, and respectable life. The sturdy Teuton took "magnetism" as he takes most things—quietly. Not so with the French; there, one was a magnetist or not a magnetist, a believer or not a believer; so that it became the *bête noire* of every patient investigator. Dr Bertrand, in 1820, gave a series of public lectures on the old theme, and General Noizet prepared a paper for the Royal Academy at Berlin; in both of these there is evidence that the Abbé Faria's experiments and observations had

not been without effect, though neither Bertrand nor Noizet had been able to free himself from the current theories, and their contributions to the question are of little value. Till the governors of the hospitals put an end to them, Du Potet, Georget, and Rostan were carrying out experiments at the Hôtel-Dieu and the Salpêtrière. Foissac endeavoured to persuade the Academy of Medicine to take up the question again, relying chiefly on the fact that Laurent de Jussieu had broken at the time with the commission of 1784, and had published the report which has been mentioned. Foissac eventually succeeded in gaining the hearing of the Academy, and they appointed a committee to decide whether a further examination of Animal Magnetism were necessary or expedient. The committee reported in favour of a commission being appointed, and in June 1825 a commission of eleven was nominated. The commission seemed to be in no hurry, and it was only after five years' research that in June 1831 they presented their report.[1]

The members of the commission proved unable

[1] The Academy were afraid to print this report, and consequently no official text is in existence. The conclusions are taken from "Rapport et Discussions de l'Academie Royale, sur le Magnétisme animal," M. P. Foissac. Paris, 1833. A translation of the report, made by J. C. Colquhoun (Edin. 1833), says that it was taken from a lithographed copy supplied to the members of the Academy. Husson also published later a work containing the report of the commission and an account of their meetings.

to rid themselves of the prevalent superstitions, and "magnetism" in consequence is responsible for everything; the volition of the operator still holds its sway; nevertheless, if we leave aside these various etiological assumptions, we find evidence of much careful observation.

In their sixteenth conclusion they give a remarkable description of certain phenomena occurring in hypnosis which has since been abundantly confirmed. The whole report is interesting as one of the earliest attempts at a systematic description of the state. A summary of the report is appended.

Conclusions.

1. The contact of the thumbs or of the hands; frictions, or certain gestures which are made, at a small distance from the body, and called *passes,* are the means employed to place ourselves in magnetic connection; or, in other words, to transmit the magnetic influence to the patient.
2. The means which are external and visible are not always necessary, since on many occasions the will, the fixed look, have been found sufficient to produce the magnetic phenomena, even without the knowledge of the patient.
3. Magnetism has taken effect upon persons of different sex and age.

4. The time required for transmitting the magnetic influence with effect has varied from half an hour to a minute.
5. In general, magnetism does not act upon persons in a sound state of health.
6. Neither does it act upon all sick persons.
7. Sometimes during the process of magnetising there are manifested insignificant and evanescent effects which cannot be attributed to magnetism alone; such as a slight degree of oppression of heat or of cold, and some other nervous phenomena, which can be explained, without the intervention of a particular agent, upon the principle of hope or of fear, prejudice, and the novelty of the treatment, the *ennui* produced by the monotony of the gestures, the silence and repose in which the experiments are made; finally, by the imagination, which has so much influence on some minds and on certain organisations.
8. A certain number of the effects observed appeared to us to depend on magnetism alone, and were never produced without its application. These are well-established physiological and therapeutic phenomena.
9. The real effects produced by magnetism are very various. It agitates some and soothes others. Most commonly it occasions a momentary acceleration of the respiration and of the circulation, fugitive fibrillary convulsive motions

resembling electric shocks, a numbness in a greater or less degree, heaviness, somnolency, and in a small number of cases that which the magnetisers call somnambulism.

10. The existence of an uniform character to enable us to recognise, in every case, the reality of the state of somnambulism has not been established.

11. However, we may conclude with certainty that this state exists, when it gives rise to the development of new faculties, which have been designated by the names of *clairvoyance, intuition, internal provision,* or when it produces great changes in the physical economy, such as insensibility, a sudden and considerable increase of strength, and when these effects cannot be referred to any other cause.

12. As among the effects attributed to somnambulism there are some which may be feigned; somnambulism itself may be feigned, and furnish quackery with the means of deception. Thus in the observation of these phenomena which do not present themselves again, but as isolated facts, it is only by means of the most attentive scrutiny, the most rigid precautions and numerous and varied experiments, that we can escape illusion.

13. Sleep produced with more or less promptitude

is a real but not a constant effect of magnetism.

14. We hold it as demonstrated that it has been produced in circumstances in which the persons could not see, or were ignorant of, the means employed to occasion it.
15. When a person has once been made to fall into the magnetic sleep, it is not always necessary to have recourse to contact in order to magnetise him anew. The look of the magnetiser, his volition alone, possess the same influence.
16. In general, changes, more or less remarkable, are produced upon the perception and other mental faculties of those who fall into somnambulism in consequence of magnetism.

(*a*) Some persons amidst the noise of confused conversation hear only the voice of the magnetiser, several answer precisely the questions he puts to them or which are addressed to them by those individuals with whom they have been placed in magnetic connection; others carry on conversation with all the persons around them.

Nevertheless, it is seldom that they hear what is passing around them. During the greater part of the time they are complete strangers to the external and unexpected noise which is made close to their ears, such as the sound of copper vessels struck briskly near them, the fall of a piece of furniture, etc.

(*b*) The eyes are closed, the eyelids yield with difficulty to the efforts which are made to open them ; this operation, which is not without pain, shows the ball of the eye convulsed and carried upwards and sometimes turned towards the lower part of the orbit.

(*c*) Sometimes the power of smelling appears to be annihilated. They may be made to inhale muriatic acid or ammonia without feeling any inconvenience, nay, without perceiving it. The contrary takes place in certain cases, and they retain the sense of smell.

(*d*) The greater number of the somnambulists whom we have seen were completely insensible. We might tickle their feet, their nostrils, and the angle of the eyes with a feather; we might pinch their skin so as to leave a mark, prick them with pins under the nails, etc., without producing any pain, without even their perceiving it. Finally, we saw one who was insensible to one of the most painful operations in surgery, and who did not manifest the slightest emotion in her countenance, her pulse, or her respiration.

17. Magnetism is as intense and as speedily felt at a distance of six feet as of six inches, and the phenomena developed are the same in both cases.
18. The action at a distance does not appear capable of being executed with success excepting

upon individuals who have been already magnetised.

19. We only saw one person who fell into somnambulism upon being magnetised for the first time. Sometimes somnambulism was not manifested until the eighth or tenth sitting.

20. We have invariably seen the ordinary sleep, which is the repose of the organs of sense, of the intellectual faculties, and the voluntary motions, precede and terminate the state of somnambulism.

21. While in the state of somnambulism the patients, whom we have observed, retained the use of the faculties which they possessed when awake. Even their memory appeared to be more faithful and more extensive, because they remembered everything that passed at the time and every time they were placed in the state of somnambulism.

22. Upon awaking they said they had totally forgotten the circumstances which took place during the somnambulism and never recollected them. For this fact we can have no other authority than their own declarations.

23. The muscular powers of somnambulists are sometimes benumbed and paralysed. At other times their motions are constrained, and the somnambulists walk or totter about like drunken men, sometimes avoiding and sometimes not avoiding the obstacles which

may happen to be in their way. There are some somnambulists who preserve entire the power of motion; there are even some who display more strength and agility than in their waking state.

24. We have seen two somnambulists who distinguished, with their eyes closed, the objects which were placed before them; they mentioned the colour and the value of cards without touching them; they read words traced with the hand, as also some lines of books opened at random. The phenomena took place even when the eyes were kept tightly closed with the fingers.

25. In two somnambulists we found the faculty of foreseeing the acts of the organism more or less remote, more or less complicated. One of them announced repeatedly, several months previously, the day, the hour, and the minute of the access and return of epileptic fits. The other announced the period of his cure. Their provisions were realised with remarkable exactness. They appeared to us to apply only to acts or injuries of their organism.

26. We found only a single somnambulist who pointed out the symptoms of the diseases of three persons with whom she was placed in magnetic connection. We had, however, made experiments upon a considerable number.

27. In order to establish with any degree of exactness the connection between magnetism and therapeutics, it would be necessary to have observed its effects upon a great number of individuals and to have made experiments every day, for a long time, upon the same patients. As this did not take place with us, your committee could only mention what they perceived in too small a number of cases to enable them to pronounce any judgment.

28. Some of the magnetised patients felt no benefit from the treatment. Others experienced a more or less decided relief—viz., one, the suspension of habitual pains; another, the return of his strength; a third, the retardation for several months of his epileptic fits; and a fourth, the complete cure of a serious paralysis of long standing.

29. Considered as a cause of certain physiological phenomena, or as a therapeutic remedy, magnetism ought to be allowed a place within the circle of the medical sciences, and, consequently, physicians only should practise it, or superintend its use, as is the case in the northern countries.

30. Your committee have not been able to verify, because they had no opportunity of doing so, other faculties which the magnetiser had announced as existing in somnambulists. But

they have communicated in their report facts of sufficient importanee to entitle them to think that the Academy ought to encourage the investigations into the subjeet of animal magnetism as a very curious braneh of psychology and natural history.

(Signed) BOURDOIS DE LA MOTTE, *President*; FOUQUIER, GUENEAU DE MUSSY, GUERSENT, HUSSON, ITARD, J. J. LEROUX, MARC, THILLAYE.

Note.—MM. DOUBLE and MAGENDIE did not consider themselves entitled to sign the report as they had not assisted in making the experiments.

As long as thc theory of hypnotie suggestion remained unknown, it was impossible for any investigator to avoid falling into many errors. The reader will notice in the report itself the rcsult of this ignorance; but as a critical and scientific examination of the states, so far as the then existing knowledge allowed, the report eannot be too highly praised. The fact that in the investigation of a subject so surrounded with pitfalls, they drew so few erroneous conclusions, tcstifics, more than anything else, to the thoroughncss of their work.

The Aeademy, however, wcre not prepared to aeeept a report which seemed to establish the fact of a "magnetic" eondition, and endeavoured to, as far

as possible, repress the publication of these investigations. Acting, presumably, on precedent, the British Medical Association in 1892 referred a report back to their committee complaining that it seemed to bind the medical profession to the use of hypnotism. In 1893 they received the report.

The mistakes which the French commission made were mainly due to the element of suggestion not being satisfactorily eliminated, though in addition to this primary error they bestowed an amount of attention on the extra-normal phenomena, such as those presented by hysterical patients, not at all proportionate to the results obtained. The importance given to this more or less mystical side of the question provided the Academy with a much desired excuse for ignoring the report as far as possible.

Thus, the second investigation, so far from setting at rest any of the disputed points, only served to intensify the general doubt and wonder. The controversy became more keen, the recriminations more violent, as time went on, and in 1837 a fresh attempt was made to arrive at some definite conclusion on the subject. One, by name Berna, urged the Academy to grant another commission to examine his experiments, and a committee was appointed in answer to his continued requests. Their report was published on July 17, 1837, and they made a *résumé* of their researches in the seven conclusions which follow. The pretensions of Berna with reference to the supernormal characteristics of the

"magnetic condition" were overthrown; and, in fact, none of these claims have ever been substantiated in a scientific manner.

Conclusions.

1. It results from all the facts and incidents which we have witnessed that, first of all, no special proof has been given us of the existence of a special state called the state of *magnetic somnambulism;* that it is solely by *assertion* not proof that the magnetiser has proceeded in this respect, by affirming to us at each séance and before any attempt at experiment, that his subjects were in a state of somnambulism.

The programme given us by the operator stated, it is true, that the subject enjoyed his full sensibility, in proof of which he could be pricked, and would afterwards be sent to sleep in presence of the committee. But it results from the experiments we made at the séance of the 3rd March, and before any magnetic process, that the subject did not seem to feel the pricking before the supposed sleep more than during it, that his bearing and answers were much the same before and during the operation called magnetic. Was it a mistake on his part? Was it natural impassibility or one acquired by habit? Was it to at once make himself interesting? That is what the committee are unable to decide. It is true afterwards that each

time we have been told that the subjects were asleep ; but we were *told,* and nothing more.

And if the proofs of the somnambulistic state were later on to result from experiments on subjects supposed to be in that state, the valuelessness and worthlessness of these proofs would follow from the conclusions we are about to draw from these very experiments.

2. According to the programme the second séance was to consist in testing the insensibility of the subjects. But, after recalling the restrictions imposed on your committee, that the face was excluded from any such experiment; that the same was the case for all parts naturally covered, so that the hands and neck alone remained; after recalling that, on these parts were allowed neither pinching or pulling, nor contact with a body either ignited or at a somewhat high temperature; that we had to confine ourselves to inserting needles to a depth of about half a line;[1] and lastly, that the face being partly covered by a bandage, we could not judge of the expression of the face whilst trying to cause pain; after recalling all these restrictions, we are justified in deducing—1st, that only *very slight and limited* painful sensations could be produced; 2nd, and that, only on a few parts perhaps used to this kind of impressions; 3rd, that this kind of impression was always the same, that it resulted from a kind of *tatooing*; 4th, that the face, and especially

[1] *I.e.*, about 1/12th of an inch.

the eyes, where painful expressions most easily show themselves, were hidden from the committee; that owing to these circumstanees even absolute, eomplete impassibility could not have been to us a conclusive proof of the abolition of sensibility in the aforesaid subjeet.

3. The magnetiser was to prove to the eommittee that by his mere will he eould restore, either loeally or generally, sensibility to his subjeet; this he called *restitution* of sensibility.

But as it had been impossible for him to prove to us by experiments that he had removed or abolished sensibility in this young lady, this experiment being eorrelative to the last, it has been for that very reason impossible to prove this restitution; and besides it results from the faets we have observed that all essays in this direetion have failed. The subject described quite the reverse of what he had announced. You remember, gentlemen, that we were redueed for verifieation to the assertion of the subject; when she affirmed for instanee that she could not move her left leg, that surely was no proof to the committee that she was magnetically paralysed in that member; but even then her words disagreed with the pretensions of the magnetiser; so that from all this resulted assertions without proof, opposed to other assertions equally without proof.

4. What we have just said about the abolition and restitution of sensibility applies to the pre-

tended abolition and restitution of movement; not the slightest proof could be given to the committee.

5. One of the sections of the programme was entitled: "*Obedience to a mental order to cease, in the middle of a conversation, and to answer verbally or by signs a particular person.*"

The magnetiser tried, in the séance of March 13th, to prove to the committee that the power of his will could produce this effect; but it results from what took place, that far from producing these results, the subject seemed to no longer hear before he wanted to prevent her from so doing, and that she again seemed to hear when he positively did not want her to hear; so that, from the subject's assertions, the faculty of hearing or not hearing would have been, in her, in complete opposition to the will of the magnetiser.

But, after well understood facts, the committee no more conclude an opposition than a submission; they have found a complete independence and nothing more.

6. *Transposition of Sight.* — Yielding to the entreaty of the committee, the magnetiser, as we have seen, had left alone his abolitions and restitutions of sensibility and movement to come to the more important facts—viz., vision without the use of the eyes. All the incidents relative to this have been told you; they took place at the séance of 3rd April 1837.

By the power of his magnetic passes, M. Berna

was to show the committee a woman reading words, recognising playing-cards, following the hands of a watch, not with the eyes but with the occiput, which implied either the transposition, or the uselessness, or the superfluity of the organ of sight in the magnetic state. The experiments took place; you know how they utterly failed.

All that the subject knew, all she could infer from what was said near her, all she could naturally suppose, she told while she was blindfolded; from which we conclude, first of all, that she did not lack a certain amount of skill. Thus the magnetiser invited one of the committee to write a word on a card and present it to this woman's occiput; she said she could see a card and even some writing on it. Were she asked the number of people present, since she had seen them enter, she said approximately the number of persons. Were she asked whether she saw a certain member of the committee placed near her, writing with a squeaky pen, she would raise her head, try to see under the bandage, and said the person held something white in his hand. Asked whether she could say what was in the mouth of this person who, ceasing to write, had placed himself behind her, she would say he had something white in his mouth; from which we conclude that the said subject was more experienced and skilled than the first, and knew how to make more plausible suppositions. But, as for facts really fit to prove sight by the occiput,

decisive, absolute unanswerable facts, not only were they wanting, entirely wanting, but those we saw were of such a nature as to make us conceive strange suspicions as to the morality of this woman, as we will presently show.

7. Giving up the hope of proving to the committee the transposition of sight, the uselessness of the eyes in the magnetic state, the magnetiser wished to take refuge in clairvoyance or sight through opaque bodies.

You know the experiments made on this point; here facts carry with them their chief conclusion, viz., that a man placed before a woman in a certain position was unable to make her distinguish, through a bandage, objects presented to her.

But here a more grave thought occupied the committee. Let us admit for a moment the hypotheses so handy for magnetisers, that at times the best subjects lose all lucidity, and that, like the rest of mortals, they can no longer see by the occiput, stomach, not even across a bandage; let us, if you will, admit all this; but what are we to conclude, with regard to this woman, from her minute description of objects *other* than those presented to her? What can we conclude of a subject who describes a knave of clubs on a blank card, who on a counter sees a gold watch with white dial and black letters, and who, had we insisted, would perhaps have ended by telling us the time indicated by this watch?

If now, gentlemen, you ask us what last and

general conclusion we are to draw from the whole of these experiments made before us, we will say that M. Berna has, without doubt, deceived himself, when on February 12th of this year, he wrote to the Royal Academy of Medicine that he would undertake to give us the personal experience we lacked (those were his words), when he offered to show your committee *conclusive* facts; when he affirmed these facts would be of a nature to enlighten physiology and therapeutics. You know these facts; you know they are far from conclusive, that they have shown nothing in favour with this doctrine of animal magnetism, that it can have nothing in common with either physiology or therapeutics.

Should we have found anything else in more numerous, more varied cases provided by other magnetisers? We will not attempt to decide; but what is well established is that if other magnetisers still exist, they have not dared to show themselves in daylight, they have not dared to challenge the academical sanction or condemnation.

(Signed) ROUX, *President*; BOUILLAUD, CLOQUET, EMERY, PELLETIER, CAVENTOU, CORNAC, OUDET.

DUBOIS (d'Amiens), reporter.

PARIS, 17*th July* 1837.

It will be seen that in this case the committee

reported strongly against Animal Magnetism, and their report was accepted, despite the protests of Husson, by a large majority of the Academy. If the report of 1831 were unsatisfaetory and indefinite, this last was even more so. By far the greater part of, if not all, the attention of the commission was devoted to a demonstration of the non-existence of certain alleged magnetic conditions, transposition of the senses, prevision, clairvoyance, etc., etc.

In fact, the eommission and the Academy had both been following the wrong scent, and it was regarded as a final settlement when Burdin (the younger), with the approval of the Aeademy, offered a prize of 3000 francs to any one who could read, or who could produce a person capable of reading, a given writing without the aid of his eyes and in the dark. The first candidate for this prize was a Dr Pigeaire, who elaimed that his daughter, a young girl about ten years old, could in the somnambulistic state, amongst many other wonders, read writing with her eyes covered by a bandage. He came to Paris, not without credentials. The Professor of Physiology at Montpellier testified to the power possessed by this girl, and in Paris he gave some séanees before several doctors, who also stated that they had witnessed an exhibition of these powers. In the beginning of the Academy's investigation a hiteh occurred with regard to the bandage. The committee would not aceept the blaek silk onc provided by Pigeaire. They justly

demanded that the bandage should be of such a kind that the subject could neither see over, nor under, nor through it. Under ordinary circumstances, a bandage is but a slight security against fraud, whilst, in the case of a somnambulistic subject, any such provision would be of little value.

Those conducting the investigation, therefore, proposed a light and easy fitting mask, that the vision might be absolutely obscured. To this Pigeaire would not listen, nor would he assent to any modifications proposed by the committee, and, as neither side would agree to the terms proposed by the other, the trial never took place.

One, by name Teste, came before the Academy with greater pretensions and ones that were easily decided. This gentleman produced a somnambulist who, he said, could read a letter or other matter enclosed in a box. The conditions were in this case, soon agreed upon, and the supposed power as soon shown to be fictitious. The subject was not able to read a word.

Others came forward with similar claims, and, on their failure, complained that the presence of the commissioners had an exciting and disturbing influence on their subjects. The Academicians then said they were ready to award the prize if the contents of the box were defined out of their presence. M. Burdin kept his francs.

That this effectively settled the question of the super-normal states, with regard to clairvoyance, is

apparent, but it by no means decided the controversy with regard to animal magnetism proper. Nevertheless, the Academy resolved, chiefly in consequence of these last experiments, that henceforth any propositions of the magnetists should not be entertained, and that the question of magnetism itself should be regarded as definitely and finally closed—a conclusion which can only be described as foolish.

The repeated failures of the various commissions, which were composed of the most learned and scientific men of the day, to separate the true from the false, or even to arrive at any near approximation of the truth, affords a striking illustration of the general uselessness of resorting to such means. Every trouble was taken, the most minute investigations, for the greater part of a century, were made, and at the end no one was much the wiser than he was at the beginning. The real issues were, throughout, little understood. The magnetisers devoted all their efforts to proving, not the existence of the magnetic state, but phenomena which were only incidental and chiefly non-existent; whilst the commissions allowed themselves to be led into the discussion of multitudinous theories to the almost entire neglect of the real question they had been appointed to investigate.

From about 1825 we hear little of animal magnetism in Germany, though, scattered about the country, there were many thoughtful and critical

enquirers. One of the most curious points is its influenee on the philosophy of the time. Sehopenhauer, and some other less known writers, made magnetism and its phenomena the basis of a large part of their philosophy. In most eountries, and in Franee partieularly, the abuses of magnetism eommon to its vulgar use were inereasing year by year. Impostors and charlatans made free use of it for the purposes of extortion and fraud of every kind, whilst the most extravagant and preposterous notions were spreading amongst the ignorant and the eredulous eoncerning it.

There are several instanees on record where the elergy practised magnetism with no less an objeet than that of obtaining supernatural revelations.

Père Laeordaire preached a sermon in 1846 at Nôtre Dame, eulogising magnetism as a power that would onee and for all confound the infidels, and demonstrate to humanity the power of the Infinite.

The Chureh was eonstantly intervening in the attempt to eheek these strange abuses, and in 1856 an eneyelieal letter was sent to all the bishops "eontra abusus magnetismi," but this attempt to eheek the prevalent abuses was fruitless.

England was late in adopting magnetism. In 1837, however, the amiable but unseientifie enthusiast, Du Potet, came to London, where he met Dr John Elliotson of the University College Hospital. Du Potet sueeeeded in engrafting on his newly-made friend all the magnetie theories, and from

this time Elliotson made use of magnetism in the hospital, and adopted it into his regular practice. The council of University College, however, soon passed a resolution against its use in the hospital, and Elliotson at once resigned. The medical papers of the time are curious evidence of what bigotry and ignorance are capable. The most vile and indecent insinuations were levelled at Elliotson, who was, at any rate, a physician of high attainments, and a perfect gentleman. Many of the charges and much of the prejudice, it is only fair to say, were due to the nonsense which Elliotson combined with his mesmeric theories. The wise man introducing such a novel method of treatment would have been most careful to avoid anything like quackery. Elliotson's experiments became little more than sober fooling. "Clairvoyance" and "Phrenology" were his constant stock-in-trade, whilst he regularly employed the two sisters "Okey" in his operations. No doubt his character was unimpeachable, but he has himself to thank for much of the persecution from which he suffered. Elliotson certainly could only have retarded the progress of hypnotism, and however we may regret the treatment to which he was subjected, it is a matter of congratulation to have been so soon delivered from what Dr Lloyd Tuckey has well called "a mass of superincumbent rubbish."

We now pass from the history of Magnetism to the beginnings of Hypnotism. Dr James Braid of

Manchester, instead of contenting himself with the mesmeric theories, placed the subject, for the first time, on a scientific basis, by a careful examination of the phenomena. The Abbé Faria had anticipated his discovery to a certain extent, but he lacked method, and his language was vague and unscientific. Braid entered upon his investigations a complete sceptic. In 1841 he attended a demonstration given in Manchester by La Fontaine, a magnetist from Switzerland, with the avowed object of endeavouring to discover the means by which the tricks (as he regarded them) were performed. Soon, however, he had to admit that whatever was their explanation, the facts themselves were undeniable; but, unlike Elliotson, he did not rest content with the operator's explanation that the means of the influence was a magnetic fluid, and he set himself to a serious study of the question. The first phenomenon that appears to have attracted his attention, as a possible clue to the secret, was the fact that the subjects were unable to open their eyes. He attributed this to the exhaustion of the optic nerves, and was led thereby to the conclusion, which he verified by experiments, that the induction of hypnosis was due to physiological modifications of the nervous system. Braid tired the nerves of his patients by fixing their gaze on some given object, a method which is very common to-day. He found that it was necessary for the subject to concentrate his thought as well as his vision, or in other words

that " expectant attention " was a necessary factor. Braid primarily demonstrated two things—

1. That the assumption of any force as a magnetic fluid, mesmeric influence, or other unknown agency, was unnecessary.
2. That the state was a supernormal physiological one, induced by a physical or appreciable action on the nervous system.

In order to distinguish these conclusions from the inchoate mass of speculation and superstition known under the name of animal magnetism, he invented the term " *Hypnotism.*"

Braid has left accounts of his various experiments and observations which show the thoroughness of his examinations, whilst they are also important as evidence of the development of the science since his time. He found that verbal suggestion was sufficient to produce hallucination, and this was a contribution to the subject of the highest importance; but he had not fathomed the theory of suggestion, and this was left for later writers, first and foremost Dr Liébeault of Nancy, to examine more fully.

The attitude would, Braid observed, affect the sentiments of the subject. With his fist clenched, the subject would assume an angry expression and prepare to fight; a pleasing action would promote a corresponding mental mood. Then again, in his *Neurypnology* he details a series of experiments in " phreno-hypnotism." By pressing on the phreno-

logieal "organs" he found he could induce the emotions belonging to each; thus, by pressing on the "organ of veneration" the subject would kneel in the attitude of prayer; if the "organ of acquisitiveness" werc touched, the subject would steal, and so forth. Phrenology has been exploded till it is beneath explosion; yet these cxperiments werc unquestionably honest and genuine. The source of his crror lay in his failurc to recognise that the hypnotised subject is extremely sensitive to suggestion; a word, a gesture, a remark of one of the spcctators, is often sufficient to indicate the wish of the operator. To this fcaturė of *unconscious suggestion* nearly all the fallacies of serious students of hypnotism have been due.

It is also a curious faet that, in most cases of deep hypnosis, the subject, when hypnotised, remembers the events which took place on the previous hypnoses, though hc knows nothing of them in the waking state. It is thus frequently possible, by an uniform adherenee to eertain touches for certain actions or emotions, for the hypnotist to dispensc altogether with verbal suggestion, and rely on the touch, which thc subjeet will instantly interpret in the desired manner. Braid was remarkably successful in the applieation of hypnotism to the allcviation and curc of disease, and it is difficult to explain how, aftcr his death, the subject eamc to be practically forgotten. Carpentcr, thc physiologist, supported him, and others of high repute. It has

been thought probable that Elliotson's experience frightened Braid from attempting to at all hastily foree his ideas on the profession ; but he, in fact, was indefatigable in its advocacy and cannot be accused of undue caution.

The faet seems to bc, that just about this time chloroform was introduced, and those of the medical profession who had paid any serious attention to hypnotism persisted in placing its chief value in the anæsthetic properties of deep hypnosis. No one properly acquainted with the subject would maintain that hypnosis could replaec the general anæsthetics, though it may be of the greatest value in cases where the administration of the usual anæsthetie would be dangerous or inexpedient.

This point, however, was quite neglected, and on the use of chloroform coming in, hypnotism seems to have been ignored, only to be reintroduced into England within quite recent years. Littré and Robin, and others, published extracts from Braid's writings in Franee, and Meunier wrote an article for the *Presse* ; but the interest was for some time purely theoretieal, and Braid's discovery attracted little attention. However, in 1850, Azam, a surgeon of Bordeaux, tried experiments, suggested by Braid's writings, on a patient suffering from spontaneous catalepsy. He also made experiments on another patient, and found they confirmed Braid's eonelusions. He published the results in the *Archives de Médecine.* In France, too, the en-

deavour was made to use hypnotism as a general anæsthetic; the difficulty was increased since it was not known that insensibility could be produced by suggestion, and thus only the subjects in the deepest forms of hypnosis could be operated on without pain. Its use for such purposes was soon rejected in favour of chloroform. From 1860, many competent investigators were engaged on the subject, and a number of works were published dealing with the subject. In 1866 appeared the famous work by Dr Liébeault, entitled "Du Sommeil et des États Analogues," etc. At the time of its publication, however, it was received with much derision by the medical faculty, but within recent years a change has come over the scene, and Liébeault is quoted and referred to largely by every writer on hypnotism or kindred subjects. For a long time Liébeault laboured at Nancy, but little noticed by his profession. In 1882, M. Dumont, who had witnessed the methods and practice in vogue at Nancy, tried some experiments on his own account. The results were so successful that he read a paper to the Medical Society thoroughly supporting Liébeault's methods and treatment. This combined, possibly, with Charcot's experiments at Salpêtrière, led Dr Bernheim to investigate the subject. He, by his own account, set to work in a very sceptical spirit, but met with results so striking and certain that he felt bound to speak. Bernheim already possessed a wide reputation, and

his adoption of hypnotism had at once the effect of securing for the subject a much more patient hearing than had ever before been the case.

Many scientific men in France and Germany had interested themselves in hypnotism, but it was not till the school of Nancy dealt with the question that it took up a real position in the scientific world. Bernheim, who had devoted himself to its study with Liébeault, published his work "De la Suggestion," etc., in 1884. Nancy became the headquarters of the leading French hypnotists. There Beaunis and Liégeois worked at the physiological and the medico-legal aspects of the question. The contests between the schools of the Salpêtrière and Nancy soon followed, and every year has served to increase the reputation, amongst scientific men of all nations, of Liébeault and his followers, whilst Charcot's school, despite the leader's eminence in his own branch, has become more and more discredited till, outside Paris, their views are hardly represented at all.

To enumerate the many students and writers in the various countries would be a lengthy task. It must suffice to say that, besides the two countries France and Germany, Russia, Denmark, Norway, Sweden, Greece, Italy, Spain, Switzerland, Belgium, Austria, the United States, South America, are all represented by many patient and learned investigators; whilst in England, Dr Milne Bramwell, Dr Kingsbury, and Dr Lloyd Tuckey, have

made valuable contributions to the study of the subject. The British Medical Association has found hypnotism "worthy of investigation," though, apparently, it could hardly reconcile itself quite so suddenly to the course recommended by the committee they appointed to invcstigate and report on the question.[1]

Mention must be made of a few who hold many of the mesmeric ideas. The Society for Psychical Research is responsible for most of them in England. The work done by Myers and Gurney, under its auspices, must rank high, and they have provided much that claims our attention and investigation. Edmund Gurney died some time ago, but the work has been carried on by Myers and others. Though this Society has published some valuable records of its work in this direction, they can hardly be considered convincing, having regard to all the circumstances; and, indeed, it has not yet claimed that the experiments can be considered as at all conclusive.

It may be fairly claimed that hypnotism has now gained a position in the scientific world that makes it imperative on all students of physiological psychology to study the facts and properties of hypnotism. The medical man who would frighten his patients by telling them tales of insanity following the induction of hypnosis, and the various fictions with which most are familiar, is

[1] *Vide* p. 45.

beginning to be generally recognised as one using long words and ominous sentences wherewith to cloak his own ignorance. At the same time, it ought to be understood that the dangers of the unscientific and ignorant use of hypnotism are manifold; and it is to be hoped that, before long, the State will intervene to regulate its use by rendering the practice of hypnotism illegal except in the hands of duly qualified men under proper restrictions.

On the historical aspect of the question we have, perhaps, bestowed more attention than is deserved; but the student of the subject will to-day meet with every variety of idea with regard to "animal magnetism," "mesmerism," and "hypnotism." The popular mind is at present quite unable to draw any distinction between them, and it is essential for the scientific student to have a clear conception of the origin of these erroneous ideas. A practical study of the question shows at once how easily such fallacies arose, whilst the practical knowledge obtained by experiment at once disposes of all the mystical superstitions, placing the investigator on a sound and scientific basis. And it will be the object of the writer in the ensuing chapters to put before the reader an account of hypnosis dealt with from a physiological point of view.

CHAPTER II

THE INDUCTION OF HYPNOSIS

Hypnosis a physiological condition—The methods of inducing hypnosis — The Mesmeric — Braid's — Passes — Berger's — Fascination—Lasegue's — Faria's — Magnets — Drugs — Luys' miroir rotatif—The Nancy method—The writer's method—The methods of waking—The stages of hypnosis—Gurney—Forel—Tuckey—Liébeault—Bernheim—Dehypnotisation — Danger of subject not waking — Duration of hypnosis—Susceptibility to hypnosis — The school of Charcot — The difference of the two schools—The "New Mesmerism" and the Paris school.

It is clear that the doctrines signified by the terms "mesmerism," "animal magnetism," "electro-biology," and the like, were incapable of any serious scientific study, since they concerned a state which, on these theories, was altogether incomprehensible if not supernatural; whether true or untrue, they may be said to stand much in the same position towards the scientific world as Spiritualism and Theosophy. By hypnotists it is claimed that this state, whether it be called mesmeric, magnetic, or what not, is one purely physiological and subjective, and this theory has been adhered to by almost all scientific men who have studied the question, since Braid first propounded it.

There are many interesting questions, such as Telepathy, Thought-reading, Clairvoyance, etc., upon which it would be perhaps rash to give any decided opinion; but it must be said that the hypnotic state *per se* has nothing to do with any of these phenomena. If telepathy be possible between two persons, it is by no means unlikely that the power would still exist, or even be increased, under hypnosis, but the writer is not acquainted with any conclusive or satisfactory experiments in this direction.

All these strange psychical conditions present problems of great interest; and if we do not attempt to deal with them here, it is because they have not a sufficient bearing on the normal states of hypnosis to justify a discussion of them.

Many methods have been used for the induction of hypnosis[1]; we shall see later that the detail

[1] Several terms which will be frequently used in the course of this book may here be defined.

Hypnotism. The science which treats of the condition which is called "hypnosis." The word is a colourless term, which we may use without committing ourselves to any theory as to the etiology of hypnosis, and especially without giving any assent, direct or indirect, to the various superstitions known under the name of "animal magnetism," "mesmerism," etc.

Hypnosis (Greek ὕπνος, sleep). The state produced by means of hypnotism, and which was formerly called the "magnetic" or "mesmeric" sleep. It is admitted that the term hypnosis, meaning, as it does, "sleep," does not adequately represent by its derivation the state produced, since many who are undoubtedly hypnotised are not in a condition of sleep. Yet it is difficult, if not impossible, to find any word which would adequately represent

of the method matters little so long as certain conditions are adhered to; the success of many of the mystical methods depended not on the alleged cause but on conditions which, though always necessarily present, were not regarded by the operators as having anything essential to do with the process of magnetising. Before describing our own methods of inducing hypnosis, it will be well to give a summary of the various methods which have been employed.

THE MESMERIC METHODS.—Mesmer did not rely on any one method, but made use of numerous contrivances, by means of which he sought to influence his patients. The essential point was that the patient should be in contact with the magnetiser or

the condition induced; and so long as we clearly understand what is meant by the term "hypnosis," we can afford to leave on one side the question of its derivative meaning. The essential characteristic of the hypnosis is not sleep, nor *a heightened and increased receptivity of suggestion* (as the writer, with most others, formerly described it), but *the presence of a condition in which the course followed by suggestive stimuli is altered so as to cause a definite reaction consonant with the stimulus.* The term *Psychypnosis*, sometimes used by the writer, would more accurately distinguish the state and would avoid confusion, but "hypnosis" is now commonly employed and we will not complicate the subject by needless terminology.

HYPNOTIST. The one who scientifically induces hypnosis.

HYPNOTEE, HYPNOTIC, SUBJECT, are words used to signify the person hypnotised. "Subject" is the one most frequently used.

HYPNOTIC SUGGESTION. Any suggestion or impression given to the patient by the hypnotist either in words, writing, or in any manner which the subject can appreciate.

the magnetised *baquet*, in order that the "fluid" might pass into the patient's body.

Braid's Method.—Braid placed some object before and slightly above the eyes of his patient. He then commanded him to gaze fixedly at this object, and to concentrate his attention on it. Ernst Jendrásik of Buda-Pesth has expressed the opinion that fixed attention is only effective because it causes fatigue of the nerves of sight, and consequently produces insensibility to external sense-stimulation. It is known that for the induction of ordinary sleep it is not necessary that all the functions of the brain should be tired, and that if any one be sufficiently wearied sleep will ensue. The strained position of the eyes, and their convergence, under Braid's method, would, undoubtedly, soon fatigue the optic nerve, and thus sleep would be induced. Braid used solely this method, and he was remarkably successful.

Passes.—On these great importance was placed by the early magnetisers, and we find the most minute directions given for their correct application and use. The "pass" proper, however, was never used by Mesmer, to whom it was unknown. Generally, the operator gazed fixedly into the eyes of the subject as long as he continued to make the passes. The will was held to be an essential element, and it was necessary for the cure that the operator should strongly exercise his will that the nerve-force might the more easily pass into the body of the patient.

These passes were divided into two kinds, "positive" and "negative." If they were used for the purpose of enveloping the patient in a healthy magnetism, they were "positive"; if they were intended to withdraw the unhealthy magnetism from the patient's body, they were then termed "negative." The mesmeric quacks of to-day profess great belief in the efficacy of these various passes, and, in one book there are described and illustrated:— "The Reverse or Upward Pass for demesmerising," "The Curative Magnetic Pass for Toothache, Neuralgia, Rheumatism," etc., "The Curative Magnetic Pass for Spinal Complaints," etc. This is, of course, pure nonsense, but several hypnotists claim that the method of simple passes is often very valuable. Ch. Richet, Professor of Physiology at the University of Paris, uses this method in preference to any other. The writer has found it very effective in many cases. The precise nature of the action of these passes is difficult to determine. Unquestionably, the element of suggestion enters in, but it is doubted by some whether this can account for all the results. It has been suggested that the difference of temperature between the hands of the operator and the face of the patient may cause a strange sensation, and thus induce an inhibitory action in the delicate nerves of the eye and of the mouth.

Berger's Method.—Berger of Breslau has stated that in some cases he found that warmth alone was

sufficient to induce hypnosis, and that in a few instances it was only necessary to warm his hands and hold them near the head of the subject.

This theory rather supports the explanation of the passes which has been suggested above. Another hypothesis is that electrical action is caused. De Tarchanoff has shown that systematic gentle stimulations of the skin produce slight currents of electricity in it, and also that these currents can be produced by a strong concentration of the will, in consequence of which concentration, muscular contraction always ensues. The mesmerists held, as the result of their observations, that a strong volitional effort was necessary, and the experiments of de Tarchanoff may serve to explain the value of this exertion of the will.

Pitres of Bordeaux states that certain portions of the body are more particularly sensitive to stimulation of the skin. These parts he terms "zones hypnogènes," and a continuous stimulus applied to any one of these parts is said to produce hypnosis in some persons.

Weinhold of Chemnitz has made use of the electric battery, and claims the same results from it as from mesmeric passes; though he does not consider that suggestion is excluded.

Eulenburg, by galvanising the head, succeeded in obtaining a lethargic condition; this experiment, was not very convincing, as the patient had already suffered from attacks of lethargy. The mental

element is certainly not excluded in these cases of electrisation; and Hirt of Breslau, whilst he constantly uses electricity in this way, is quite positive that it is not the galvanic current but the indirect suggestion which causes the hypnosis.

FASCINATION.—This method, introducing as it does a large amount of the personal element, is a favouritc one of the mesmeric "professors." Thc subject is told to gaze steadily into the operator's eycs. It frequently happens that in a short space of time the subject will imitate every movement of the operator, all the while keeping his eyes firmly fixed on those of the operator. This method is somewhat risky, since, if the subject be refractory, the operator himself may involuntarily become hypnotised. Lloyd Tuckey records an instance where, in using this method on one occasion, he found himself developing the first symptoms of hypnosis.

LASEGUE'S METHOD.—Lasegue, a physician of Paris, found that closing the eyes and then making a moderate pressure on the eyeballs for some minutes often induced the statc.

FARIA'S METHOD.—The Abbé Faria used to concentratc the attention of his subject as much as possiblc, and after some minutes of perfect silence, would suddenly shout in a loud and commanding voicc thc word "slecp." In many cascs this was sufficicnt to obtain the dcsircd result.

MAGNETS.—Scvcral authorities claim that thc magnet has in some cases the power of hypnotising.

Ballet, Binet et Féré, Landowzy, and Proust, all of Paris, and Benedikt of Vienna hold this view. After many careful experiments the writer can confidently say that he has been unable to find any trace of such influence, and this result is confirmed by the almost universal testimony of hypnotists in all parts of the world. It may be that in a certain few abnormal cases the magnet has this virtue; but it seems a more natural hypothesis to attribute these few hypnoses to suggestion, an element which enters into nearly every method, and which is so subtle in its action that it is almost impossible in these cases for an operator to state positively that it has been entirely avoided. Braid has left on record an experiment of his which bears on the supposed influence of the magnet. A lady told him that she could not endure a magnet being brought near her, and that it always had the most profound influence on her; and so it did *when she knew of its proximity*; but Braid, in order to test the nature of this influence, sat next to her on one occasion, for half an hour, with a powerful magnet concealed in his pocket, and, as he expected, found that no effect was produced.

Drugs.—Chambard places the anæsthetics chloroform, ether, and other similar drugs, amongst the agents for producing hypnosis. That, in some cases, a receptivity to suggestion occurs in the state produced by the action of drugs is undeniable; but the same may be said of certain abnormal forms

of ordinary sleep, and it seems an unnecessary confusion of the subject to regard these analogous states as hypnotic.

LUYS' "MIROIR ROTATIF."—This is an ingenious instrument, invented by Dr Luys of the Charity Hospital, Paris. It consists of two mirrors, rapidly revolving in opposite directions, and by gazing at this for a short time the sight becomes tired and dazzled, and hypnosis is easily produced.

Many advantages are claimed for this method—that it saves the operator time and trouble, and is impersonal; that a number of people can be hypnotised at the same time by its means; and that it never fails.

The saving of time is not really so great as might be imagined, for each subject must need the hypnotist's personal attention, whilst there are many other methods equally impersonal. Only fairly susceptible persons, and those who had been previously hypnotised, would, generally speaking, be influenced *en masse*, and these could be hypnotised as quickly by almost any other means. It is, however, of some service in certain cases.

THE NANCY METHOD.—No scientific hypnotist adheres rigidly to any one method. He finds that, where it is the brain that is most intimately concerned, the idiosyncrasies and character of each subject must be studied, and a method chosen which seems most likely to take effect. In all the differences of details, however, there is one main

principle now recognised by the whole body of scientific hypnotists, and this is the theory of suggestion.

The Abbé Faria, in 1814, is apparently the first who can be said to have made any advance towards the elucidation of this principle. Braid, in 1850, we have seen, by his insistence on the necessity of concentration and fixed attention, made great advances; but to Liébeault of Nancy belongs the honour of giving to the world a scientific exposition of the *rationale* of hypnotism. We have it from Liébeault's own lips that he was first attracted to the subject by reading Braid's works, and he has constantly admitted that the Nancy system is indebted to Braid for its real genesis. In connection with Nancy must be mentioned Bernheim, who has greatly developed and systematised the study of hypnotism.

The method in common use at Nancy is as follows :—

The patient is comfortably seated in an easy chair, with his back to the light, and the operator stands by his side, holding up two fingers of his own hand some few inches from the patient's eyes. The patient is told to look intently at these two fingers, and, as far as possible, to keep his mind a blank. As soon as the eyes begin to show symptoms of weariness, the hypnotist begins in a somewhat muffled and monotonous tone of voice to suggest sleep.

Sometimes the operator, without waiting for the

symptoms to appear, will start at once telling the patient, "You are beginning to feel drowsy," "Your sight is getting dim," etc., etc., whilst in other cases he will wait till the eyes begin to blink somewhat, and then seek to increase the sleepiness by suggestions, which are made as the symptoms begin to develop themselves.

It is not to be supposed that in all cases precisely the same formula or details of treatment are followed; but the principle is the same. Thus this method of Nancy takes Braid's system of physically wearying the eyes, and combines with it a system of verbal suggestion, and this method is the one followed with variations in detail by the leading hypnotists.

As a matter of fact, there is no one plan which will succeed in all cases; some patients will be quite uninfluenced by one method of treatment, whilst they will be readily susceptible to another. Dr Moll says that he has succeeded in hypnotising by means of "passes" where fixed attention and simple suggestion both failed, and *vice versâ*.

The method generally adopted by the writer does not differ materially from the Nancy method above described, but we shall here incorporate into our description details of practical importance. The first essential for the successful induction of hypnosis in a person who has not previously been hypnotised, is to ensure that the person is in a position which is quite comfortable, and which he

will be able to maintain during the period of induction without discomfort; every little detail in this respect is an important feature in determining the degree of success or failure on the part of the hypnotist in a large number of cases; the kind of chair in which the patient sits, its relation to the lighting of the room; the position of his legs and feet, arms and hands; the head, whilst being supported, must not be allowed to fall backward, and the subject must sit as squarely as his comfort will allow. The surroundings must be free from any disturbing influences, and noises which we should not generally notice cause more difficulty than the larger volumes of sound; thus, the ticking of a clock, the quiet opening or shutting of a door, the whispering of persons inside the room—all these things serve to distract the attention of the subject at a critical time. The subject should be asked to keep his mind a blank as far as possible; he should be told not to trouble himself about any methods used by the hypnotist; not to pay attention to what he may say, and especially not to try and help him by trying to "go off"; and every trouble should be taken to see that the patient is quite calm and free from undue nervousness. Having placed the subject comfortably in the chair, the next point is to fix his attention. For this purpose, it is not theoretically necessary that we should resort to any physical assistance, but the attention is fixed much more easily when some such assistance

is employed. To gain attention the fixation of the sight is the best and readiest means, and we therefore tell the subject to look steadily and without blinking more than can be helped at some given object. The exact object matters little; it may be the operator's finger, or a disc held in the patient's hand, but it should not be more than about a foot from the eyes of the subject. It should be placed in such a position that when looking at it the eyes are fairly wide open; the light should fall on the object, and the subject should have his back towards the source of light. The hours after daylight are, on the whole, to be preferred, for in the morning the nervous irritability is generally greater than in the evening; the subject is consequently rendered passive with greater ease, and his general condition is more favourable. After an evening meal, most people are willing to remain quietly in a chair for a short period, whereas, earlier in the day, the enforced restraint might be more or less troublesome; for the purposes of concentration of light on the object to be looked at, artificial light is better than daylight. It must not be assumed that these detailed observances are in all cases necessary, for it greatly depends on the susceptibility of the subject; but if one is to gain an average of anything over eighty per cent., it will only be by attention to these details. The first hypnosis is always the most difficult, and after the subject has been hypnotised a few times we can generally dispense with

a great many of these precautions. Let us now watch the subject. Passive, and with his gaze fixed on the given object, he at first appears to be in the normal condition; after an interval of varying duration, a change comes over the subject. The writer confesses that to describe the change in so many words he finds impossible, but the experienced hypnotist easily recognises it; the pupils have somewhat dilated; the eyelids may be quivering; the subject is more absorbed in the object than he was at first, the face has lost its usual expression, the respiratory rhythm is slightly altered. At this point the skill of the hypnotist has its greatest scope, for everything depends on the rapid and accurate perception of the changes which the subject is undergoing; hypnosis is *beginning*. The characteristic reaction of the subject to suggestion is also beginning, but it is far from complete, and we have to judge when the subject can take the first suggestion and how much he can take. If we begin too early, we shall disturb him; if we wait too long, he may, and often does, return, more or less, to the normal and we have missed our opportunity. This return is followed by a gradual resumption of the hypnosis, and before the final hypnosis is induced, this alternation may take place several times. The early suggestions must not be of a character repellent to the subject's consciousness. Thus, fact and suggestion are mingled with suggestion and fact—"The eyelids are quivering;

the eyes are tired; the sleep is coming"—until gradually the state diverges more and more from the normal; the final hypnosis generally comes suddenly. The eyes close, and one symptom is nearly always present—a peculiar, deep, catching inspiration—and others will be described in the chapter dealing with the phenomena of hypnosis. The inductive stages may therefore be classified as—

1. Passivity.
2. Passivity with attention.
3. Acute passivity with acute attention.
4. Hypnosis.

The hypnosis thus obtained varies with each individual; but there are certain classifications which are important; some pass into a light stage; others into a deep stage; as a rule the hypnotic state deepens with every hypnosis till about the fourth or at most the sixth hypnosis; by this time the subject will have reached *his* deepest stage; in the hypnosis subsequent to this, he presents the phenomena of this stage. This is a curious but constant phenomenon, and enables us to classify each subject according to his stage of hypnosis, a point which, in experimental work, is exceedingly useful. These stages vary from a condition which only an expert can recognise as an hypnosis to a condition in which the strikingly abnormal phenomena are present. The variety of these stages is so great that many observers have made attempts at classification,

and these are useful in giving the reader an idea of the great differences between the hypnoses of different subjects.

Gurney,[1] whose researches are valuable, though speculative, divided hypnosis into two stages—

1. The "alert" stage.
2. The "deep" stage.

Forel names three states—

1. Drowsiness.
2. Inability to open the eyes. Obedience to suggestion.
3. Somnambulism. Loss of Memory.

Lloyd Tuckey gives a very similar classification to Forel's—

1. Light sleep.
2. Profound sleep.
3. Somnambulism.

Liébeault has described six different stages—

1. Drowsiness.
2. Drowsiness. Suggested catalepsy possible.
3. Light sleep. Automatic movements possible.
4. Deep sleep. The subject ceases to be in relation with the outer world.
5. Light Somnambulism. Memory, on waking, indistinct and hazy.

[1] *Vide* "Proceedings of the Psychical Research Society."

6. Deep somnambulism. Entire loss of memory on waking. All the phenomena of post-hypnotic suggestion possible.

Bernheim suggests no less than nine divisions—

1. Drowsiness. Suggestions of local warmth are effective.
2. Drowsiness with inability to open the eyes.
3. Suggestive catalepsy slightly present.
4. Suggestive catalepsy more pronounced.
5. Suggestive contractures may be induced.
6. Automatic obedience.
7. Loss of memory on waking. Hallucinations not possible.
8. Loss of memory. Slight possibility of producing hallucinations, but not post-hypnotically.
9. Loss of memory. Hypnotic and post-hypnotic hallucinations possible.

Beaunis prepared an analysis of Liébeault's figures, which is very interesting—

Results of Experiments in 1012 persons.

Drowsiness	33
Light Sleep	100
Deep Sleep	460
Profound Sleep	230
Light Somnambulism	31
Deep Somnambulism	131
Unaffected	27
	1012

These various classifications are, however, extremely unsatisfactory. The terms "drowsiness" and "sleep" ought to be excluded from an accurate differentiation; and "somnambulism," a word which already has a definite implication in another sense, should certainly be excluded.

The extent to which suggestion affects the subject depends on the extent to which he is divorced from consciousness of the external, and on the degree to which the psychical action of the neuronic groups is inhibited. In the deeper states, where there is absence of memory on waking, this divorce is complete, and the particular phenomena of the deeper stages depend on the physiological irritability of the particular nervous system in hypnosis. We may thus classify the stages as—

I. Light hypnosis.
   (*a*) External consciousness present.
   (*b*) External consciousness slightly present.
II. Deep hypnosis. } No memory on returning to the
III. Profound hypnosis. } normal condition.

It is useless to attempt more detailed classification than this. Thus in Bernheim's stage 3, the phenomena of stages 5 and 6 may easily be obtained, the degree of suggestive catalepsy putting it in stage 3, the other phenomena putting it in these later stages. Moreover, many post-hypnotic suggestions obtain their reactions almost as well in the lightest stages as in the deepest, provided the suggestions be of a character to suit the condition.

In the medical application of hypnosis the use of the light stages in this respect is well known; the phenomena of hallucination and other phenomena requiring well-marked concomitant changes in the nervous system are naturally confined to the stages of profound hypnosis.

The dehypnotisation, or waking from hypnosis, is effected by suggestion, on the same principle as that on which the state is induced. Physical means, such as blowing on the eyes, may be used; but, in any case, they can only be regarded as aids to the suggestion, and their value depends entirely on the mental impression they produce.

Many means are recommended by various writers for waking the patient; fanning, sprinkling with water, loud calls and noises, etc. Just as the downward pass may hypnotise, so the upward pass (by reason of the mental suggestion it conveys) will serve to awaken; though some have claimed that the cool current of air caused by these passes is responsible for the awakening.

According to Pitres and others, there are certain parts of the body where stimulation has an awakening effect; to these they have given the name, "*zones hypno-férnatrices.*"

The forcible opening of the eyes will sometimes awaken the patient. The use of these physical means is quite unnecessary and to be avoided, though blowing lightly on the eyes to ensure the suggestion taking immediate effect is useful.

There is no difficulty or delay in ending the hypnosis; in all cases the subject is brought back to the normal state instantaneously. In the hands of an unskilful or ignorant operator, however, the subject may pass from the waking state into a condition of apparent lethargy; and out of the hands of the experimenter, who is able neither to awaken nor to influence his subject. These misfortunes can never occur to the practised hypnotist; but many such cases are known, and the danger of these rash experiments in hypnotism cannot be too strongly insisted on.[1]

When once it is found that the patient does not awaken in obedience to the operator, *no further attempts to wake him should be made*, but an experienced hypnotist should be immediately sent for, or, if one cannot be found, the subject should be

[1] A case is recorded by Dr Julius Solow (*New York Medical Journal*, March 14, 1891). A young man was hypnotised by a friend, at an evening party, for fun. The first attempt produced trembling throughout the whole body; a second trial was made with no better result; the third time the subject was seized with violent trembling of the arms, and he began to shiver. He then fell on the floor, jumped up, became merry, laughed, joked, and sang; then violent convulsions set in, followed by loss of speech; catalepsy next supervened, and the whole body, except the arms, became rigid. For two days convulsions, loss of speech, and catalepsy recurred very frequently, and the sight of anything bright excited the man to madness. Various sedatives were tried, and for ten days his condition was not much improved; but after this the severe symptoms began to give way to outbursts of alternate singing and lamenting; and after another period of twelve days, during which time his temperature went up to 103°, he recovered.

allowed to sleep it off. In the one or two cases of the kind which have come under the writer's notice, the harm done was almost entirely due to the ignorant and futile attempts made to arouse the patient.

The duration of the hypnotic sleep of the subject, if not awakened, is very variable. Some subjects will wake at the precise moment when the operator leaves them, the fact of his absence acting as a suggestion that they are no longer under his control. Others will be awakened by an unexpected or loud noise. Some will be roused from the state by efforts made in it; thus, for instance, a subject has been awakened by laughing loudly in obedience to an hypnotic suggestion. If the sleep be light, subjects will often return to the natural state in a very short period; but if it be deep, the sleep may continue for three or four hours. Bernheim mentions a case in which the sleep lasted eighteen hours.

The condition after hypnosis is found to be perfectly normal. In the hands of an experienced hypnotist the subject never finds that he is suffering from any such things as "drowsiness" or "giddiness." Any ill effects are due entirely to the fault of the operator.

Various opinions have been expressed, some well many ill informed, with reference to the persons who are hypnotisable. It would be idle to affirm of any particular temperament that it lends itself to hypnosis when we find that over eighty per cent. of

all persons tried is the *minimum* average of any one who properly understands the subject in its practical application. Speaking from his own experience the writer has found that the class presenting the least difficulty, and generally giving satisfactory experimental results, is to be found in young men of average education and of fairly all-round qualities; such a man, for instance, as is typical of Oxford or Cambridge.

Excessive self-consciousness presents some difficulty, and consequently the more or less brilliant neurotic and the very stupid and conceited resemble one another in being difficult subjects. Idiots are not hypnotisable, and the insane are excessively difficult to hypnotise. Sex does not appear to materially affect the question. There is a somewhat common misconception prevalent which regards hysterical conditions as likely to indicate easy hypnotisability. Hysteria, however, is nearly always the source of much difficulty and never makes the induction easy. Nationality has very little to do with the matter. Taking nationalities of very different temperaments we find little difference in the recorded results. In France, Liébeault hypnotised 985 out of 1012; in Sweden, Wellenstrand hypnotised 701 out of 718; and in Holland, Van Rentezhen hypnotised 169 out of 178. Bernheim and Forel agree, with reference to the medical application of hypnosis, that the opinion of physicians who cannot hypnotise at least eighty per cent. of

their patients is of no value. The present writer's percentage in all his cases between Jan. 1892 and Dec. 1896 was 91·5. Amongst members of the University of Oxford his percentage was 95·84. And judging from his observation of a large number of cases he is on the whole inclined to regard susceptibility to hypnosis as generally belonging to men with brains of good quality; unquestionably the process of hypnotising well educated people is easier, and, as a rule, takes less time.[1]

Reference should here be made to conditions of hypnosis not recognised by most authorities, but described originally by Charcot and upheld by some of his pupils. These states are not, in the writer's opinion, at all representative of normal hypnosis, but, if accurately described, are pathological curiosities due to the peculiar material used for the experiments. We append an extract from Charcot's description of these states:—

"1. *The Cataleptic State.*—This may be produced: (*a*) primarily, under the influence of an intense and unexpected noise, of a bright light presented to the gaze, or, again, in some subjects by the more or less prolonged fixing of the eyes on a given object; (*b*) consecutively to the lethargic state, when the eyes, which up to that moment had been closed, are exposed to the light by raising the eye-

[1] In 50 first hypnoses of poor people the average time taken by the writer was 6 min. 10 sec.; in 50 first hypnoses of Oxford undergraduates the average time was 4 min. 40 sec.

lids. The subject thus rendered cataleptic is motionless and, as it were, fascinated. The eyes are open, the gaze is fixed, the eyelids do not quiver, the tears soon gather and flow down the cheeks. Often there is anæsthesia of the conjunctiva, and even of the cornea. The limbs and all parts of the body may retain the position in which they are placed for a considerable period, even when the attitude is one which it is difficult to maintain. The limbs appear to be extremely light when raised or displaced, and there is no *flexibilitas cerea*, nor yet what is termed the stiffness of a lay figure. The tendon reflex disappears. Neuro-muscular hyperexcitability is absent. There is complete insensibility to pain, but some senses retain their activity, at any rate in part—the muscular sense, and those of sight and hearing. This continuance of sensorial activity often enables the experimenter to influence the cataleptic subject in various ways, and to develop in him by means of suggestion automatic impulses, and also to produce hallucinations. When this is the case, the fixed attitudes artificially impressed on the limbs, or, in a more general way, on different parts of the body, give place to more or less complex movements, perfectly co-ordinated and in agreement with the nature of the hallucinations and of the impulses which have been produced. If left to himself, the subject soon falls back into the state in which he was placed at the moment when he was influenced by the suggestion.

"2. *The Lethargic State.*—This is displayed: (*a*) primarily, under the influence of a fixed gaze at some object placed within a certain distance of the eyes; (*b*) in succession to the cataleptic state, simply by closing the eyelids, or by leading the subject into a perfectly dark place. At the moment when he falls into the lethargic state, the subject often emits a peculiar sound from the larynx, and at the same time a little foam gathers on the lips. He then becomes placid, as if plunged in deep sleep; there is complete insensibility to pain in the skin, and in the mucous membrane in proximity with it. The organs of the senses sometimes, however, retain a certain amount of activity, but the various attempts which may be made to affect the subject by means of suggestion or intimidation are generally fruitless. The limbs are relaxed, flaccid and pendent, and when raised they fall back again as soon as they are left to themselves. The pupils are, on the other hand, contracted, the eyes are closed, or half-closed, and an almost incessant quivering of the eyelids may usually be observed. There is an exaggeration of the tendon reflex; neuro-muscular hyperexcitability is always present, although it varies in intensity. It may be general, extending to all the muscles of the animal system, the face, the trunk, and the limbs; and it may also be partial, only present for instance, in the upper limbs and not in the face. This phenomenon is displayed when mechanical excitement is applied to a nerve-

trunk by means of pressure with a rod or quill; this causes the muscles supplied by this nerve to contract.

"The muscles themselves may be directly excited in the same way; somewhat intense and prolonged excitement of the muscles of the limbs, trunk, and neck produces contracture of the muscles in question; on the face, however, the contractions are transitory, and do not become established in a state of permanent contracture. Contracture may also be produced in the limbs by means of repeated percussion of the tendons. These contractures, whether produced by excitement of the nerves or muscles, or by percussion of the tendons, are rapidly relaxed by exciting the antagonist muscles. As it has been already said, the cataleptic state can be instantaneously developed in a subject plunged in lethargy, if while in a light room the upper eyelids are raised so as to expose the eyes.

"3. *The State of Artificial Somnambulism.*—This state may, in some subjects, be immediately produced by fixity of gaze, and also in other ways which it is not now necessary to enumerate. It may be produced at will in subjects who have first been thrown into a state of lethargy or catalepsy by exerting a simple pressure on the scalp, or by a slight friction. This state seems to correspond with what has been termed the magnetic sleep.

"It is difficult to analyse the very complex phenomena which are presented under this form.

In the researches made at the Salpêtrière, many of them have been provisionally set aside. The chief aim has been to define, as far as possible, the characteristics which distinguish somnambulism from the lethargic and cataleptic states, and to demonstrate the relations which exist between it and the two latter states.

" The eyes are closed or half-closed; the eyelids generally quiver; when left to himself the subject seems to be asleep, but even in this case the limbs are not in such a pronounced state of relaxation as when we have to do with lethargy. Neuro-muscular hyperexcitability, as it has been defined above, does not exist; in other words, excitement of the nerves or of the muscles themselves, and percussion of the tendons, do not produce contracture. On the other hand, various methods, among others passing the hand lightly and repeatedly over the surface of a limb (mesmeric passes), or, again, breathing gently on the skin, cause the limb to become rigid, but in a way which differs from the contracture due to muscular hyperexcitability, since it cannot, like the latter, be relaxed by mechanical excitement of the antagonistic muscles; it also differs from cataleptic immobility in the resistance encountered in the region of the joints, when the attempt is made to give a change of attitude to the stiffened limb. To distinguish this state from cataleptic immobility, strictly so called, it is proposed to distinguish the rigidity peculiar to the somnambulist state by the

name of *catalepsoid rigidity*; it might also be called *pseudo-cataleptic.*

"The skin is insensible to pain, but this is combined with hyperæsthesia of some forms of cutaneous sensibility, of the muscular sense, and of the special senses of sight, hearing, and smell. It is generally easy, by the employment of commands or suggestion, to induce the subject to perform very complex automatic actions. We may then observe what is strictly called artificial somnambulism.

"In the case of a subject in a state of somnambulism, a slight pressure on the cornea, made by applying the fingers to the eyelids, will change that state into a lethargy accompanied by neuro-muscular hyperexcitability; if, on the other hand, the eyes are kept open in a light room by raising their lids, the cataleptic state is not produced."[1]

It is seen at once that between these theories of Charcot and those of the Nancy school there is a very wide difference.

Liébeault, Bernheim, and in fact almost every authority in hypnotism, know nothing of these phenomena produced *without* suggestion, with the exception of Charcot and his school, and one is inclined to think that having originally committed errors of observation due to the non-elimination of suggestion, the Salpêtrière school, in the endeavour to maintain their scientific reputation, have been too unwilling to modify opinions expressed when the

[1] Comptes rendus de l'Académie des Sciences.

study of the subject was less developed. Charcot has said, " At the very outset my studies dealt with hysterical women, and ever since I have always employed hysterical subjects." [1]

It seems plain that, however valuable such studies may be from a pathological point of view, they can have little to do with the normal conditions of hypnosis, and we think that more than due importance has been attached to them.

The articles which appeared in the *Times* at the beginning of 1893, entitled " The New Mesmerism," and the many articles which have been written on the abuses of hypnotism in the Paris hospitals, have dealt solely with the methods and experiments of the Paris school ; and the theories of this school have now been rejected in favour of the theories of the Nancy school, based as these are on the large and increasing observation of many workers in various countries.

[1] Magnetism and Hypnotism. *The Forum*, Jan. 1890.

CHAPTER III

THE PHENOMENA OF HYPNOSIS

Characteristic feature—Pulsation—Respiration—Passivity—Effect of hypnosis on the eyes and mouth—Suggestive movements and inhibition of movement—Inability to contract, and antagonistic contracture of muscles—Movements made without and against the will—Means of Suggestion—Donatism—The muscular sense—Nature of the muscular contractures—Automatic Movements—Occasional state of Lethargy—Absolute catalepsy—Charcot and neuro-muscular hyperexcitability—Hypnotic anæsthesia—The psychological value of hypnotism—Retention of ideas in hypnosis—The phenomena of memory in relation to hypnosis—Increase of memory by suggestion—False memory—Errors and loss of memory due to suggestion—Connection of motor disturbances with memory—Particular inhibition—Deprivation of perception—Deprivation of perception and conception—Post-hypnotism—Hallucinations and illusions—Value of post-hypnosis—Continuative suggestion—Deferred suggestion—Various kinds of suggestion—The post-hypnotic states—Phenomena of the lighter stages—Illusion of resistance—Their classification—Depth of hallucinations—Examples—Modifications of the pulse, temperature, respiration—Hallucinations, illusions, and increase of sight—Spontaneity of hallucination—Of hearing—Of taste—Of smell—Of touch—The sense of pressure—Hallucinations of colour—The muscular sense—Unilateral hypnosis—The mental condition of subject under hallucination—Consciousness in hypnosis.

THE characteristic feature of hypnosis is the presence of a condition in which a suggestion causes a

reaction of the central nervous system definitely corresponding with the nature of the suggestion; underlying this bald statement are some complex problems, which we shall discuss in their proper place, and in this chapter we shall confine our attention, as far as possible, to a description of the hypnotic phenomena, leaving the etiological questions thus involved for separate treatment. All the phenomena here to be discussed range themselves then either as phenomena of hypnosis itself or as phenomena dependent upon hypnotic suggestion.

The alterations of the ordinary functions of the body during hypnosis vary in their degree and number in accordance with the method of hypnotisation. Some subjects are able to move with perfect ease and freedom; thus they will brush a fly off the face with the hand, or change their position when one posture becomes wearying. Others present to the superficial observer all the appearances of being in a heavy sleep. The breathing is slower and deeper than in the normal condition, the inspirations being full and prolonged; the pulse is somewhat slower, but increased in fulness and strength; in both respiration and pulsation there is an increased regularity. During the passage of the subject from the normal to the hypnotic condition the signs are not so constant; but, as a rule, one finds a slight acceleration of both pulsation and respiration.

Sex.	Age.	Five minutes before Hypnosis.		During Induction of Hypnosis.		In Hypnosis.	
F.	18	120	24	110	24	84	20
M.	35	72	16	70	16	66	16
M.	21	84	20	110	25	70	18
F.	60	72	18	80	20	66	16

TABLE of Four Cases, showing the pulsation and respiration before, during the induction of, and in Hypnosis.

At the moment when the subject passes into hypnosis there is always, more or less marked, a deep inspiration of peculiar quality.[1] The hæmic murmur of anæmia has a curious tendency in some cases to diminish or disappear in hypnosis; whilst mitral systolic, aortic

[1] The mitral presystolic is certainly affected by hypnosis; in one case under the writer's observation it regularly disappeared in hypnosis, and on careful auscultation one could hear the gradual diminution; it generally took about three minutes to disappear entirely; but for the last two minutes it could hardly have been recognised had it not been previously heard. In another case a presystolic murmur developed in hypnosis; this murmur, however, was not new, as the subject had had it for two years previously, if not longer; in subsequent hypnoses its appearance was typically irregular; on more than one occasion it was present in the normal state immediately before hypnosis, and disappeared in hypnosis. The hæmic murmurs of anæmia are, however, frequent in their disappearance, though in a good many cases of this class they may remain unaltered. In a case recently under observation a girl, aged twenty-three, had a marked systolic murmur, heard at the apex and the base, and in both subclavian arteries, with the venous hum well developed; after the subject had been in hypnosis five minutes the venous hum had almost disappeared, and the murmur at the apex and in the subclavian arteries was absent; at the base it was still heard, though much diminished.

diastolic, and other murmurs of endocarditie origin appear usually to be unaffected. The general eondition of the subject when hypnosis has been indueed is one of aeute passivity; the position which the patient has taken up may remain the same down to the smallest detail for the spaee of half an hour or more; the fingers, elasped or open, will so remain. If at the beginning one foot has been slightly inverted, in half an hour's time it will be inverted to the same degree; if the head have drooped on one side, though the attitude be one seriously uneomfortable for a person in the normal state to maintain, it will remain in the same position. The subjeet ean hear perfeetly well; but the most amusing story may be told to others in the room without provoking the slightest reaetion in him. The normal irritability of the nervous system has disappeared in a striking manner, and the stimuli provoking a reaction in the ease of a person in the normal eondition will produee no effeet on him when hypnotised.

The eyes and the mouth often show striking symptoms of the onset of hypnosis. The elosing of the eyes is generally preceded by a marked quivering of the eyelids, and these vibrations are often maintained for some time after the eyes have elosed.

It is not always neeessary that the eyes should be elosed for a person to be hypnotised, though this is generally the ease, and in many instanees to open

the eyes would awaken the subject. When the method of fascination is used the eyes may remain wide open the whole time. In the deepest hypnosis it is frequently found that the eyes are not quite closed, but that there is a slight opening left, through which the eyeball can be seen. Sometimes, as the eyes close, the eyeball turns upwards and remains in this position till the subject is awakened; at other times it is found that the eyeball returns to its natural position when the eyes are closed.

Perhaps a more subtle symptom is the strange effect which the induction of hypnosis produces on the delicate muscles of the mouth. This symptom is one of the most constant, and may be observed more or less marked in almost every case whether the hypnosis induced be light or deep. Often the symptom is only recognisable by a slight compression of the lips; but frequently the contraction of the muscles is so obvious that the subject appears to be indulging in a grim smile.

In any but the lightest stages of hypnosis all muscular movements can be prevented or induced by means of suggestion. Thus the statement, "You cannot open your mouth," or "You cannot bend your arm," is sufficient to prevent the action being performed.

The subject may be unable to make the movement because he cannot contract the proper muscles; whilst in other cases the suggestion causes a con-

tracture of the antagonistie museles, and thus the forbidden movement beeomes impossible. The simple inability is frequently seen when the suggestion, "You cannot open your eyes," is made. Unable to eontraet the proper museles, the subjeet attempts to open his eyes by elevating his eyebrows. The eourse of the suggestion in these eases is different, and depends upon the nervous system of the subject. In the case of simple inability the suggestion aets as a direet inhibition of motor impulses of the proper neuronie group; in the case of antagonistic eontracture the suggestion is expressed in physieal terms by the action of the opposing group.

It is also possible to allow or prevent eontraction for any one partieular purpose. A subject, in response to the proper suggestion, will be able to say some definite word, but in all other respeets will be absolutely dumb. He will be able to write, play the piano, sew; but quite unable to hold in his hand some given objeet.

As any museular eontraction ean be inhibited so a contraetion ean be enforeed. Thus the suggestion may be made that it is impossible for him to prevent his arm rising to a level with his shoulder; if there be any effort on the part of the subjeet to prevent this, it is on aeeount of some suggestion that he should resist. The suggestion just mentioned eontains the elements of such an additional intimation.

By means of suggestion it is possible to compel the subject to cough, sneeze, laugh, weep, etc., etc. Paralysis of a leg or a foot, an arm or a hand, can be induced in the same way. In the case of those subjects who are in a deep stage a series of movements will be performed by them if they be so directed.

It is important to note that while suggestion may be made, and usually is made, *verbally* to the subject, it is by no means necessary that words should be used. All that is requisite is that the subject should clearly understand what it is that is desired of him. The organs of sense and perception are all channels for the conveyance of any suggestion made to the subject. It is found, for instance, that some action on the part of the hypnotist will tend to bring the suggestion more vividly before the mind of the patient.

This fact led many to suppose that the physical action of the operator had some intrinsic value; such is, however, not the case; its only value lies in its power of intensifying the impression which it is desired to create. The professional magnetisers have been very fond of a particular method which is called, amongst other names, "imitation," "fascination," and "Donatism" (this last from Donato, who made great use of it). In this system the operator fixes his eyes on the eyes of the subject, and after a short time the subject follows every movement made by the magnetist. If he lift an

arm, the subject does the same; if he kneel, the subject kneels; and so on *ad infinitum*. Here fascination was the form of hypnosis induced. The same state can be obtained by opening the eyes of an hypnotised person, when the hypnotist, by gazing fixedly into his subject's eyes will be able to obtain these imitative movements. If the finger, or the mounted top of a walking-stick, be placed before the subject's eyes, he will follow the finger, or the stick, as the case may be; in all this it is clearly suggestion which is the basis of the phenomena. The subject will not perform any of these imitative actions, nor will he be "fascinated" by the stick, unless he fully understands that it is expected of him.

In very many ways, by a look or a movement, the hypnotist is often able to convey a suggestion to his subject which will be quite as potent as if made by means of speech. This extreme susceptibility to suggestion is either not known or is overlooked by the ordinary public, and the professional hypnotisers often avail themselves of this common ignorance to deceive those who may attend their exhibitions.

There is a particular form of suggestion which acts, in the first place, on what has been termed the muscular sense. By this term is meant that faculty which tells us, without the necessity of looking, the position of our limbs. It causes a peculiar phenomenon in hypnosis. The arm of a subject under

hypnosis is raised by the hypnotist, and then let go. Instead of falling to his side the arm remains fixed in the position in which the hypnotist left it. In other cases, however, the subject will let his arm fall until the hypnotist gives the verbal suggestion that it shall remain rigid. The important point to be noted is that, in each case, suggestion was the cause of this catalepsy; only in the former where the state was deeper and the subject in consequence more receptive of suggestion, it was sufficient to act on the muscular sense alone, whilst in the latter it was necessary to intensify the suggestion by speech. Of course, other means could be used for the suggestive intensification besides speech; if the arm were held in one position for some minutes by the hypnotist, or a pass were made along the arm, the intended suggestion would probably take effect.

It has been said (Moll) that these muscular phenomena of contraction must be distinguished from the suggestion which induces them, and, certainly, the examination of any catalepsed limb is sufficient to show that in consequence of the suggestion there has been a striking physical change; but it is also claimed that in some cases the contraction is so great that a contrary suggestion will not suffice to counteract the effect of the first. The writer has observed numerous cases of the most rigid catalepsy, but this failure of the second suggestion is quite unknown to him; though frequently there is a delay of a few seconds before

the arm regains its proper elasticity. This, however, seems explained by the auto-suggestion which the contracted state of the muscle would naturally have on the mind of the subject.

If, for example, the subject be prevented from shutting his mouth, when the contrary suggestion is made, the mouth will shut with a snap, clearly showing the suddenness with which the efferent impulses have ceased.

Another common phenomenon of the state is that called by Liébeault and Bernheim "automatic movement," and by Max Dessoir "continued movement." If the subject's arms be rotated, or his hands set revolving round one another, they will continue to rotate or revolve. This again is due to an impression made on the subject, by virtue of which the result is precisely the same as if a verbal suggestion had been made to him. Various and strange automatic movements will be continued by the subject, when they have been once started by the hypnotist, such, for instance, as rising from his chair and then sitting down, working the head backwards and forwards, opening and shutting the mouth, etc., etc. The subject will even continue to walk, if he be properly started.

In some few cases an extremely lethargic state is found in which the subject is apparently almost impervious to suggestion, and appears to be in a heavy sleep. This condition is accompanied by great muscular relaxation; the head falls forward,

and the body loses all its strength and rigidity; if left to himself the subject will often fall from the chair and sink on the floor in a huddled mass. It is said by some that these subjects are insensible to suggestion; but, in a considerable number of cases of this description, it is possible to obtain a certain degree of susceptibility by adopting means calculated to strongly impress the subject with the suggestion; when this is gained, however, the response is often not decisive, and great languor still characterises all the movements.

The extent to which it is possible to obtain muscular contraction is clearly seen in the catalepsy of the entire body, when the whole of the voluntary muscles become absolutely rigid. In this condition, the body may be placed with the head on one chair and the feet on another, and will remain in a perfectly straight line between these two points. So complete is the rigidity that the body in this position will sustain an enormous weight without bending. A youth, by no means athletic or exceptionally strong, in this rigid state, can sustain, without any apparent uneasiness and without any harmful result, a weight exceeding one hundred and fifty pounds.

Nearly every one is familiar, if only by repute, with the ordinary phenomena of the hypnotic state; motor impulses can be inhibited; deafness, dumbness, blindness, in many cases, can be caused, the special senses can be suppressed, so that the

strongest ammonia can be held under the nostrils without the patient evincing any sign of discomfort. The proper suggestions being made, he will eat pepper and think it is sugar, or eat a tablet of soap with *gusto*, under the impression that it is a piece of cake. Indeed, almost every sense and organic function of the body may be affected. Anæsthesia is present in the deeper stages, and can be increased by suggestion.

The study of psychology has received but little help from hypnotism on account of the general neglect of its phenomena; the importance of a careful observation of the phenomena of hypnosis with regard to the psychological point of view can hardly be exaggerated. In a field of work where the opportunities for definite experimental work are few, the condition should have been more employed than it has been up to the present; too many writers on psychology, however, appear to think that a casual acquaintance with the subject is all that is necessary as a basis of opinion. The psychical phenomena present are amongst the most striking characters of hypnosis and hypnotic suggestion. We have already referred to the lack of psychical activity present in the subject, when simply in hypnosis, without the effects of suggestion. The psychical action, however, is in some always limited; the powers of idcation are strictly limited to the quality of the suggestion, the subject does not wander off into other matters; *he does no*

voluntary thinking; the ideation present is in strict relationship to the stimulus supplied. If it be suggested that he is a General, he will act according to his conception of a General; he will give orders, treat those around him as soldiers and officers—and do many other things; but he will not act as his consciousness would generally tempt him to under ordinary circumstances; he will not give any sign of *independent* ideation; the relative merits of various Generals, the strategy of one, the knowledge of another, would not be described by him, even if in the normal condition he knew about these things, unless specific suggestion to this effect were given. The knowledge of a subject will undoubtedly materially affect the phenomena; thus a suggestion that he is fishing for trout to a boy who has never handled a rod and to an expert angler, would give very different results; but in both cases the concentration of the consciousness around the suggestion would still be the same; independent ideation would in both cases be equally conspicuous by its absence. From physiological considerations this limitation is important.

Without express suggestion it does not appear that the capability of retaining ideas in hypnosis is materially increased. Beaunis has not been able to find any abnormal phenomena, nor has Max Dessoir arrived at a different result. The few experiments which the writer has made coincide with these. When, however, it is suggested that

there shall be an increase of memory, the results are most striking. On this point it is often very difficult to avoid unconscious suggestion, since the mere repetition of any words or lines frequently acts as a suggestion that the subject is to remember them.

Whilst, however, the retention of ideas for a long time is not increased, there is reason for thinking that, apart from suggestion, there is a greater capability for a short period, *i.e.*, the subject, in hypnosis, would remember more of a speech five minutes after its delivery than he would in the normal state.

To a subject quite ignorant of Greek, the writer repeated the sentence:—"Καὶ καταγόντες τὰ πλοῖα ἐπὶ τὴν γῆν, ἀφέντες ἅπαντα ἠκολούθησαν αὐτῷ," and found that he could recite more, after one repetition during hypnosis, than after one repetition in the waking state. The experiments on the point, though they all tend to confirm this view, have not been sufficiently extensive to justify the categorical assertion that this temporary increase is a common characteristic of hypnosis.

In the lighter stages of hypnosis the memory is perfect; in the hypnosis the subject's memory of his normal state is active, and, on the ending of the hypnosis, he is able to describe all that occurred.

In deeper stages the memory is lost, unless, after awakening him, some hint be given to the subject; this may serve to bring the whole chain of

events to his recollection. Heidenhain instances the case of his brother to whom, under hypnosis, he said, "*Alles schweige jeder neige, ernsten Tönen nun sein Ohr.*" This sentence, his brother, on awakening, made many attempts to recollect, but entirely failed, until Heidenhain mentioned the word "schweige." The cases of this sudden recollection upon a hint being given are comparatively few in number, and in these cases, generally, the memory is hazy, and often resolves itself into some such question as, "Did you say anything about so-and-so?"

In the deepest states memory is entirely lost, the subject fails altogether to remember any event of the hypnotic sleep, and when anything he may have done under hypnosis is pointed out to him he manifests the greatest surprise.

A very important fact to be noticed is that, if the subject be hypnotised a second time, he will remember all the events of the previous hypnosis; and thus a deep hypnotic subject may be said to lead two distinct lives—the hypnotic, in which he remembers spontaneously all the suggestions which have been made and the events which have taken place during previous hypnoses; and the waking, in which he has no recollection or knowledge of these events.

In a certain number of cases it would appear possible to obtain in hypnosis the recollection of events which the subject has long forgotten. This

is, however, a difficult subject to investigate; we all fail to remember at times, and it is difficult to say whether or not in the normal state before the hypnosis the subject is exhibiting such a phase of merely temporary failure of recollection. Again, it is easy to induce a "recollection" in hypnosis simply as a result of the suggestion; the subject will give a full account of anything if only the suggestion be made that he is able to remember; but the "recollection" has no other basis. In consequence of these difficulties, experimental enquiry has not given any striking evidence. On the other hand, the induction of an altered condition, such as hypnosis, may be the means of spontaneously unlocking memory which has long ago ceased to affect the consciousness of the individual. For memory is largely a senso-motor process, and the inhibition which is removed from certain neuronic groups would allow of an action impossible under normal conditions. The acute memory thus evolved is seen in the following case:—

A girl in a state of deep hypnosis was in a room at the Salpêtrière, when Parrot, the physician to the refuge for *Enfants assistés*, entered. The subject was asked what was the stranger's name, and she replied, to the surprise of all present, and without hesitation, "M. Parrot." On awaking she declared that she did not know him; but after looking at him for a long while, she finally said, "I think that he is a physician at the *Enfants*

assistés." When about two years old she had been for some time in this refuge, and had long forgotten the physician, whom she recognised with difficulty, on waking, while she could, in hypnosis, give his name when ordered to do so.[1]

Another case, even more remarkable, is that of a woman of fifty, who was hypnotised, and who, to the hypnotist's great surprise, began to speak English, although no one present knew that she could understand a word of the language. During her waking state she did not know a single word of English, and it could be proved that, at any rate for twenty-five years, she had never spoken it. The only explanation possible is that, when very young, she must have have had some knowledge of the language.[2]

The hypnotic memory is an element which the experimenter has to carefully guard against, lest he be led into many errors by neglecting the necessary precautions. If, for instance, the operator has been in the habit of connecting some particular touch or pass with the verbal suggestion of an act, he will find that, owing to the memory of the subject connecting the touch or pass with the verbal suggestion, he can dispense with speech, and rely solely on the touch for the production of the desired effect. This explains many of the tricks of the magnetisers, who have learnt, in the same way, to

[1] Binet et Féré, op. cit., p. 136.

[2] Felkin. Hypnotism. London, 1890.

omit verbal suggestion, and thus add to the mystery of their performances.

One frequently finds the subject interpreting some act of the hypnotist as a suggestion; on a first hypnosis the writer slightly raised the subject's hand, and then by suggestion made it rigid; in all hypnoses since it has been only necessary to elevate this hand to obtain the rigidity. Moll told a patient to raise the left leg; as he gave the command he involuntarily took hold of the patient's right hand. When, in a later hypnosis, he took hold of his right hand the patient immediately raised his left leg.

Another instance of the hypnotic memory often occurs during hallucinations. Thus, if a subject imagine himself a General, he will lead the regiment into the field, incite his men to press forward, and will hear all the noise incident to a battle; if, after several other hallucinations, he finds himself a child, some loud and unexpected noise during this imaginary childhood may serve to bring back the previous suggestion that he was a General, and he will promptly go through all his previous actions peculiar to this hallucination.

So far we have treated memory as we find it in the hypnotic state, naturally, and apart from the action of suggestion. With the introduction of suggestion we find some very important results. To the increase of memory, as occasionally a

natural phenomenon of hypnosis, we have already referred in our experiments on the increase due to suggestion. Definite results have not been obtained, and this is due to the difficulty, already mentioned, of distinguishing between the heightened power belonging to the hypnosis itself, and that development caused by the precise suggestion. The only means of at all satisfactorily arriving at the degree of the suggestive memory is by first questioning the subject during hypnosis as to some fact of his life till his memory fails him, and then ascertaining whether he can throw any further light on the matter by a suggested increase of memory, not, however, being deceived by a suggestive increase of recollection. This spontaneous adaptation of mind, by no means to be confounded with simulation, is clearly seen in the phenomenon of *False Memory*. If it be suggested to a subject that he has been to America, he will give details of his visit, describe what he saw, name the boat on which he sailed, etc., etc. The details given will, naturally, correspond with the education and knowledge of the person. Thus all the information about America that one subject could give was the "White House," which he saw "in New York."

Another, however, though he had not been out of England, spoke with great accuracy of many of the American habits and institutions. Referring to the cosmopolitanism of New York, he said that one met every nationality under the sun in its

streets; he described the political differences between the "Republican" and the "Democrat."

The effects of hypnotic suggestion in increasing the retentive powers of normal memory are striking, and, in the writer's experiments at Oxford, few were more successful than those performed with this object. Several Oxford undergraduates reading for the University examinations were anxious that an attempt should be made to improve their memory by means of hypnotism. From previous experiments it was anticipated that the result would be beneficial, and the effects in all the cases of weak memory which have come under the writer's notice have been very marked. In one case a youth, ætat. 20, complained of the extreme difficulty which he found in remembering dates and the comparative positions of localities. In less than a week he was able to remember a whole page of dates after two or three readings, and this increase of faculty was permanent.

It may be said that such increase of faculty must have a prejudicial effect on the general health of the individual, much in the same way as the use of stimulants will, for a time, increase, but finally lower, the mental and physical powers. Such is, however, not the case if the operation be at all properly performed. The danger of a nervous lassitude and innumerable other dangers are all existent in the use of hypnotism by the unscrupulous or the unskilful. Properly handled, there is no method

more entirely devoid of danger than hypnotism. This question will be referred to more fully later.

It is also possible to produce by means of suggestion either errors of memory or loss of memory. One subject in obedience to an impression of the former kind, not only maintained that the date of the Conquest was 1067, but commented on the general inaccuracy of historians in this matter; in another case the patient was induced by suggestion to forget, when writing to a person, the number of the house in which he was residing; and this person never received a letter from him correctly addressed; though, in obedience to the suggestion, the subject was quite able to remember the proper number when he called.

Loss of memory can be induced, and the recollection of any period of the subject's life may be completely destroyed. The subject can be made to forget his own name, his age, where he lives, or what is his occupation. According to Forel and to Franck it is possible to cause a subject to forget entirely a language he has learnt.

There are many delusions closely connected with the memory, in that they depend on this faculty for the induction; under this head may be classed the phenomena of False Memory already described. If the subject be told, "You have just been running extremely fast; you ran half a mile as hard as you could go," he will, in consequence of the false re-

collection induced, gasp for breath and feel considerable fatigue.

Another suggestion may be made, "You have not had anything to eat to-day." On waking, he will not only say that he has had nothing, but will feel extremely hungry, and demand something to eat.

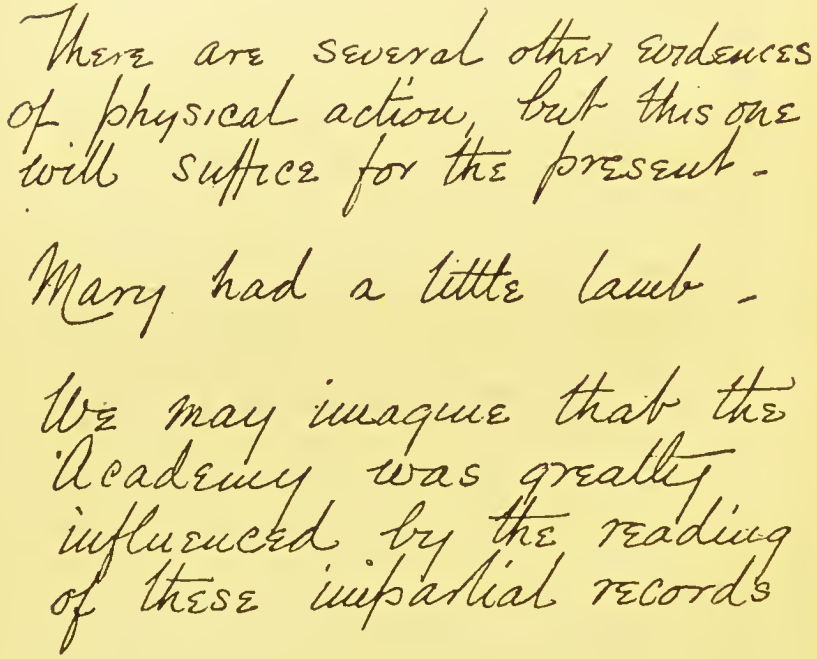
There are several other evidences
of physical action, but this one
will suffice for the present.
Mary had a little lamb.
We may imagine that the
Academy was greatly
influenced by the reading
of these impartial records

FIG. 1.—*Normal Writing.*
(Reduced one-fourth.)

Many of the motor disturbances may be considered as related to loss of memory, since a movement is made impossible if the memory of it cannot be first called up (Moll). This is the case with the paralysis for a special act, called by Binet et

Féré "paralysies systematiques," and in these cases the paralysis is not attended by total functional incapacity of any group of muscles interfered with; but the function is interfered with for one particular purpose. An hypnotised person may be deprived of the power of making himself understood by facial expression. In the same way any particular act,

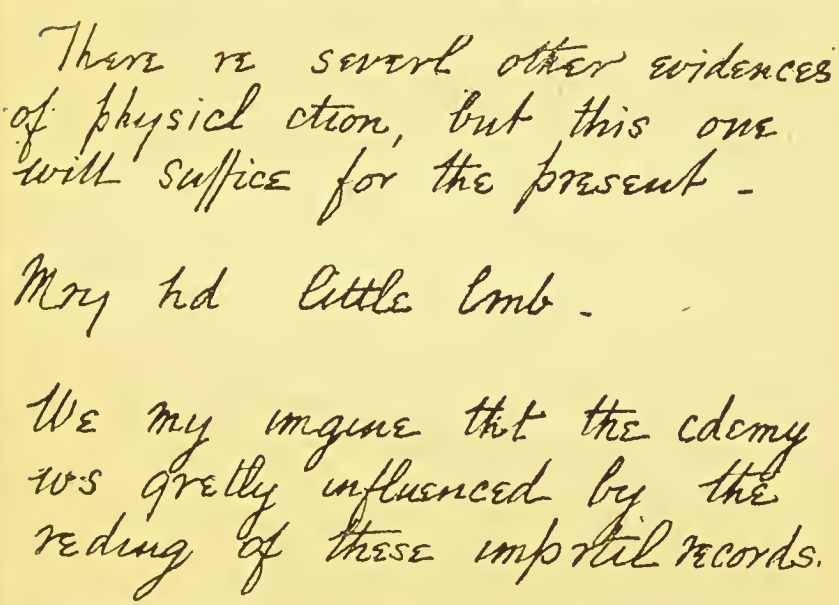
There re severl other evidences
of physicl ction, but this one
will suffice for the present -
Mry hd little lmb -
We my imgine tht the cdemy
wos gretly influenced by the
reding of these imprtil records.

FIG. 2.—*The idea of "a" lost.*
(Reduced one-fourth.)

such as drawing, sewing, writing, singing, etc., can be prevented. With reference to these particular inhibitions it is important to note that they range themselves in two distinct classes. The subject may be deprived of the perception, for instance, of

a word or letter, and, in consequence, of the power to write it; the *idea*, however, of the particular word or letter he will, or will not, retain, according to the suggestion made.

If he retain the idea of the word or letter he is quite conscious of his inability to utter or to write it; he is annoyed with himself on account of this inability, and will endeavour to avoid using it.

Thus, for instance, it was suggested to a boy in hypnosis that he would be unable to utter the word "Mary." On waking him the following dialogue ensued:—

Now, will you please repeat this sentence, "Mary had a little lamb"?

Subject. She had a little lamb.

No, I said "*Mary* had the little lamb."

S. She had a little lamb.

Please repeat the sentence as I quoted it.

S. (after a pause) "*Polly* had a little lamb."

Will you be so good as to say, "*Mary* had a little lamb"?

S. (indignantly) Well, I told you she had a little lamb.

After many evasions and excuses he confessed that he could not pronounce the word "Mary."

The extreme acuteness of the subject in finding excuses for the non-performance of an action is often very marked. In the last experiment the subject was a boy, ignorant and not of striking intelligence; nevertheless he endeavoured to get

over the difficulty by every device in his power. He cannot explain, even to himself, his inability; he is ashamed of it, and naturally tries to avoid exhibiting it; if, however, he knew that it was on account of an hypnotic suggestion, he would not be discomforted, since then the explanation would be obvious to him and to those around him. But his consciousness knows nothing of the suggestion. When the subject is deprived of the *conception* of a letter there is no manifestation of annoyance at his inability to write it; he, in fact, has entirely lost the idea, and, in writing, will consistently omit the letter. The illustration appended is a facsimile of what was written by an Oxford undergraduate, when both the power of writing and the idea of the letter "a" had been destroyed (see Figs. 1 and 2).

The reader will notice that where "a" occurs separately a distinct space is left, and this fact is one of considerable psychological importance. The writer has often endeavoured in such experiments to obtain an explanation from the subject of his reason for leaving these spaces; the only answer has been, however, that he does not know why; and he generally seeks to fill up the gap, when it is pointed out, by prolonging the "flourish" of the last word.

Almost any inability may be suggested. Thus, a subject (the undergraduate referred to) was rendered incapable of spelling correctly, with the result as shown in Fig. 3.

These experiments lead us to consider the phenomena of post-hypnosis. In the lighter stages of hypnosis suggestion not only may act during the hypnosis, but will be found to have caused an alteration in the normal condition, when the hypnosis has been removed, if such alteration has been suggested. In this way pain may be removed, and for the therapeutical applications of hypnotism,

The hol toun was surounde
bi a lofte wal the hite of
whic on the syd whic faced
the mauland was we are
told a ~~boor~~ hundrud and
fiftie feat -

FIG. 3.—*Absence of Ability to Spell.*
(For normal writing, see facsimile, page 116.)
(Reduced one-fourth.)

the induction of the deeper stages of hypnosis is scarcely ever necessary. In a certain sense, then, we may class all such effects as a post-hypnosis, but the term is as a rule confined to a state quite distinct. Many writers have used the word "drowsiness" to describe the very light stages; but this is hardly a fitting term; there are no symptoms of drowsiness; the condition of the patient, though

still conscious of the external, is curious. He is exceptionally passive; he continues in the condition we have described on p. 98. In these lighter stages some remarkable results, dependent on the presence of consciousness to the external, are obtained. On the hypnosis being removed, the subject may say that he has not been hypnotised at all; he is quite positive as to this, and some difficulty is often found in persuading him that he really has been hypnotised. The fact that he knows to a certain extent what is going on around him, has prevented him realising that he is hypnotised, whilst the hypnosis itself has prevented him realising the alterations. He remembers perfectly well all that took place in the hypnosis, and explains his inability to open his eyes, or part his hands, by saying he could have done so if he had wished, but he did not want to bother about trying. This answer is characteristic of a certain type of hypnosis, and the "illusion of resistance" is a fairly common phenomena of the lighter stages.

A curious instance of this tendency is seen in the following case:—A friend, whom the writer had hypnotised several times previously, complained of feeling very ill and suffering from pain—a complaint that was borne out by his appearance. I hypnotised him, and he fell, in about a minute, into his usual state of light hypnosis. When the operation was finished and he was about to be awakened, he suddenly said, in a very measured

and listless manner, indicative of the fact that he was still under the influence, "You know I'm not hypnotised; you couldn't prevent me doing anything." He was immediately dehypnotised and he was astonished to find that, so far from being ill and depressed, he felt well and happy. Had it not been for the fact that he was previously suffering nothing would have convinced him that he had been hypnotised.

Richet has described much the same phenomenon:—

"One of my friends, who was drowsy but not quite asleep, carefully studied this phenomenon of incapacity, combined with the illusion of capacity. When I prescribed a movement, he always performed it, even although he had, before he was magnetised, been determined to resist. He found this hard to understand when he awoke, and said that he certainly could have resisted, only he did not wish to do so. Sometimes he was inclined to believe that he was simulating. "When I am asleep," he said, "I feign automatism, although I believe that I might act otherwise. I begin with the firm determination not to simulate, but as soon as I am asleep it seems that, in spite of myself, simulation begins."

With the deeper stages, where on waking there is no knowledge of what has taken place in the hypnosis, the characteristic phenomena of post-hypnosis may be obtained. For these phenomena the

suggestion is altered somewhat, so that it runs—"*When you awake* you will have no idea of the letter 'a,'" and so forth.

Any suggestion that takes effect in hypnosis will also take effect post-hypnotically, provided the hypnosis be sufficiently deep to admit of post-hypnotic suggestion being executed. Suggestive paralysis has lasted for several days. Krafft-Ebing suggested to a patient that he should maintain a definite bodily temperature for a fixed time, and this suggestion was accurately fulfilled. In the same way, any movement or any delusion of the senses can be induced; dreams can be suggested, and sleep free from dreams. The suggestion carried on from hypnosis into the normal state is called a continuative suggestion; as for instance when a subject is given toothache in the hypnotic state and is told that he will still suffer from it when he awakes. A common but interesting experiment is the following. The suggestion is made, "You will count up to ten, and you will wake when you get to five." The result is not always the same; sometimes a subject will count up to five, then open his eyes and finish the counting in an automatic and mechanical manner; others will wake at five, and will not continue the counting. The continuative form of suggestion is not often used, and the hypnotist generally relies on the suggestion to be carried out after waking.

It is not necessary to its success that the sugges-

tion should take immediate effect. Let it be said to a subject, "When you come to see me this day fortnight, you will not be able to speak;" and on that day he is quite unable to utter a word.

There are innumerable forms of such deferred suggestion. It must be noted, however, that some forms will not always succeed with certain subjects. Thus, he is told, at four o'clock, that when the clock strikes five, he will find that he is at a concert, and will go to the piano and sing. Immediately the suggestion is given he is awakened, and he will talk and conduct himself quite naturally, and will not have the least idea that any such suggestion has been made to him; only, as soon as the clock strikes five, he will get up, and seating himself at the piano will begin to sing.

In this case the precise time for the carrying out of the suggestion is fixed by an external sign, and these suggestions nearly always succeed. If, however, we do not name any such concrete sign, but rely on something less definite, such as a period of time, the results are more uncertain.

The suggestion is made to a subject that in an hour's time he will get up and dance; some will carry out the suggestion punctually; others will dance, but they will begin a quarter of an hour too soon, or (very rarely) a little late; with many the suggestion will altogether fail owing to its want of definiteness.

These "time" experiments are generally value-

less when performed before a large number of spectators; as the time approaches, the audience begin to give various indications of their expectation, and, as the precise time arrives, will look at the clock; this is quite sufficient to give the external sign often necessary to make the experiment a success, and, consequently, any result obtained is of no value.

Another means of deciding the moment for the execution of a post-hypnotic suggestion is the following:—The hypnotist says to the subject, "When I get up and open the window, you will immediately become very angry." He is awakened, and converses amicably enough till the window is opened, when he at once begins to look seriously annoyed. Asked what he is angry about, he says, that "to open the window was a ridiculous idea; did we not know that he objected to draughts," etc., etc.

The suggestion may be made more subtle if the subject be told to laugh when the hypnotist, for, say, the tenth time, taps his hand on the table.

As they talk together, the hypnotist unconcernedly taps the table with his fingers; at the tenth tap the subject laughs. Frequently, though, the execution of the suggestion will not be so precise, but will happen a little before or after the exact moment.

By many subjects deferred suggestions will be carried out, though their execution be delayed for a long period. It was suggested to a friend that, in

eight weeks time, he should, in writing, reverse the writer's initials; during the intervening period several letters were received all correctly addressed, but at the end of this time a letter came with the initials reversed.

It was hardly expected that this experiment would succeed—for, in the first place, there was no mention of any precise date, such, for instance, as July 20th, which would have materially added to the suggestive force, but only a period of eight weeks; and, in the second place, the suggestion was one peculiarly opposed to his knowledge and his habit.

It is frequently possible to obtain the fulfilment of post-hypnotic suggestions at extremely distant periods.

Sometimes these succeed when the suggestion is lacking in precision, as, for instance, "You will write me a letter, saying that you think I must be unwell, on the fortieth day counting from to-day."

Success is more often obtained when the suggestion names some precise day. It was suggested on July 10th to a subject, "You will come to me on September 20th and find me standing on my head." The suggestion was obeyed, and on September 20th he came, and laughing, asked, "Since when have you become an acrobat?"

The question naturally arises, "What is the precise condition of the subject during the action of the post-hypnotic suggestion?"

This is not capable of a very simple answer, because the state varies with the person hypnotised, and it is necessary to clearly understand the nature of these conditions before any explanation is possible. An example of each of these post-hypnotic states follows.

I. The suggestion is made to B, a person under hypnosis, "When you awake, directly I place my hand on the table, you will be unable to remember your name." After waking he talks, and, when asked, gives his name immediately; the conversation is resumed, and the hypnotist puts his hand on the table; the subject is quite unable to give his name, though he seeks to excuse himself by saying that he has already given it a moment before. All the time, however, there is no listlessness or absent-mindedness, and he is not open to any further suggestions. If a day or two afterwards the hand is placed on the table it has no effect on his memory. Not only this, but he recollects perfectly the inability to remember his name on the previous occasion. Here we have no symptoms of the recurrence of hypnosis.

II. To another subject, C, it is suggested that when he awakes if A speak to him he will make a grimace at him; if B speak to him he will put out his tongue.

A speaks to him, immediately he makes a grimace at him—each time A speaks C does the same thing. B speaks, and C puts out his tongue.

Asked "Why did you make that grimace just now?" he insists that he made no grimace. "Why, then, did you put out your tongue?" "I did not put out my tongue," he replies, and nothing will induce him to admit that he performed either of these actions. He is quite unsusceptible to any other suggestions, and remembers our conversation; he only fails to recollect the suggested actions, and the remarks of A and B, with which they were connected.

III. It is suggested to D that directly he awakes he shall pace up and down the room twelve times; he does so, and during the time he is walking up and down the room the hypnotist tells him that the floor is very hot; he jumps off the floor and endeavours to spring over the room in order to avoid burning his feet; he is told that he is intoxicated, and he begins to roll about as a drunkard. Directly he has finished the twelfth turn up and down the room, it is suggested that he cannot hold out his hand, but he holds out his hand without any difficulty.

In this case, then, the subject is susceptible to suggestion so long as he is performing the act, but is quite independent directly he has completed it. This subject also remembers nothing either of the walking or of the sensation suggested.

IV. The hypnotist says to A, who is hypnotised, "When you wake, as soon as I get up from my chair you will go to the clock and alter the hands

till they stand at four o'clock." The hypnotist wakes him, and they talk together. There is not the least appearance of drowsiness or sleepiness. Suddenly the hypnotist rises from his chair; immediately the subject turns to look at the clock and becomes, as it were, extremely absent-minded; in a moment, hardly paying any attention to the conversation, he goes to the clock and in a listless mechanical way alters its hands. It is then suggested to him that he cannot see, that he is deaf, etc., and all these suggestions he accepts. To destroy this state of suggestibility it is necessary to reawaken him. Here then we see three stages.

α. Hypnosis.

β. Waking state.

γ. A condition in which he obeys the post-hypnotic, and is open to further suggestion.

Moll says that he is unable to distinguish the condition "γ" psychologically from a true hypnosis, and this seems perfectly sound. Delbœuf's statement that to make a post-hypnotic impression is really to order a new hypnosis at a fixed moment, in which the suggestion will be carried out, only applies to these cases of post-hypnosis.

V. The last condition necessary to describe is a case of spontaneous waking. Thus it is suggested to E that he will play the piano as soon as he wakes; he goes to the piano and begins playing. Suddenly he is told that he has broken the instrument; he

looks somewhat dazed for a moment, and then wakes up entirely.

He is able to recollect the playing of the piano; but his memory is not perfect. He says that it comes to his mind much as a dream does; in a few hours his memory of the act is still feebler, in a day or two it is quite absent.[1]

The important symptoms of these various stages seem to be the renewed susceptibility to suggestion and the loss of memory. On the question whether the state of renewed suggestibility is in reality a true hypnosis, many have made numerous experiments. Edmund Gurney, in particular, has contributed some valuable results on this branch of the subject.[2]

A striking experiment was once made by Forel. He said to a nurse, "Whenever you say 'Sir' to the assistant physician, you will scratch your right temple with your right hand without noticing." The nurse talked rationally and clearly all the time, but she was quite unconscious that she was scratching her face, which she did whenever she used the word "Sir."

It will be seen from the above examples that the nature of the post-hypnotic state varies greatly, and this variation is dependent on the individuality of the subject. The reader who wishes for more on

[1] In this classification of the states in post-hypnotism the writer has in great manner followed Moll. Op. cit., p. 144 *et seq.*

[2] *Vide* Proceedings of the Society for Psychical Research.

this subject may refer with advantage to Liébeault, Richet, Bernheim, Delbœuf, Gurney, Forel, Dumontpallier, Beaunis, Liégeois, and others. In the writer's experience the first stage of post-hypnosis, namely, that stage in which the subject is normal in every respect save in the performance of the suggestion, is the most frequent, and the other stages are placed in the order of their frequency.

After this consideration of the various post-hypnotic stages, we are the better able to understand the phenomena of hypnosis and post-hypnosis which we now proceed to discuss.

Hallucinations and Illusions.—With the ordinary delusions induced by the professional magnetisers for the purpose of their "entertainments" most persons are acquainted, and it is in consequence unnecessary to describe them very fully. We find in profounder hallucinations many important clues to the psychological nature of the change wrought by hypnosis on the mind of the subjcct. Ch. Richet has recorded many of his observations, and one of them is typical of the deep-seated nature of the hallucinations.

Mme. A——, a respectable matron, underwent the following metamorphoses:—*As a peasant.* She rubbed her eyes and stretched herself: "What o'clock is it? Four in the morning!" She drags her feet as if wearing sabots. "I must get up and go to the stable. Now, La Rousse turn round!" She assumes to be milking a cow. "Leave me

alone, Gros-Jean; leave me alone, I say, and let me get on with my work." *As an actress.* Her face, so harsh and dissatisfied a moment before,

The whole town was surrounded by a lofty wall the height of which, on the side which faced the mainland, was, we are told, a hundred and fifty feet.

Still the religiousness of Phoenicians does not rest on any a priori arguments or considerations of what is likely to have been.

The effect of this conformation of the country is unmeasurable.

FIG. 4.—*Normal Writing.*
(Reduced one-fourth.)

assumes a smiling expression. "You see my skirt? My directer insisted that it should be longer. In my opinion, the shorter the better; but these

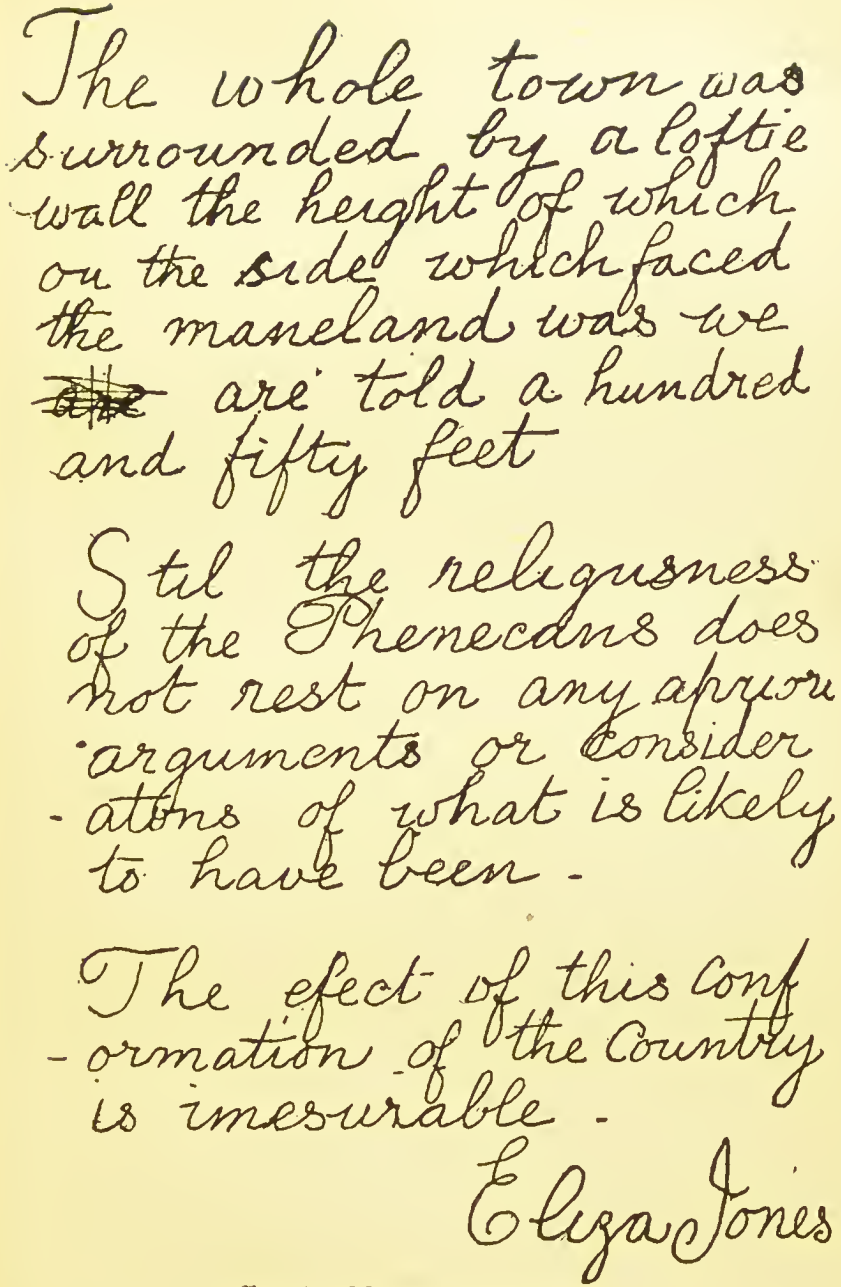

FIG. 5.—*Writing as a little Girl.*
(Reduced one-fourth.)

directors are always annoying. Do come and see me sometimes; I am always at home at three. You might pay me a visit, and bring a present with you." *As Archbishop of Paris.* Her face assumes a very serious expression, and she speaks slowly, in a voice sweet as honey: "I must finish writing my charge. Oh, it is you, M. le grand vicaire. What do you want? I did not wish to be disturbed. . . . Yes, this is New Year's Day, and I must go to the cathedral. . . . This is a very reverent crowd, is it not, M. le grand vicaire? There is still a sense of religion in the people, whatever happens. Let that child come near, that I may bless him." She presents an imaginary ring for the child to kiss, and throughout this scene she makes gestures of benediction to the right and left. "I have now another task in hand. I must go and pay my respects to the President of the Republic. M. le President, I give you my good wishes. The Church wishes you a long life; in spite of the cruel attacks made upon her, she knows that she has nothing to fear as long as a perfectly honest man is at the head of the Republic." She pauses, appears to listen, and says aside, "Yes, yes, only false promises!" Then aloud, "Now let us pray"; and she kneels down.[1]

In the same way a subject may be led to believe he is a dog, when he will go on all fours, bark, growl, and he will even attempt to bite fresh-

[1] Revue Philosophique. March 1884.

comers. As a pig, he will wander about the room, grunting and snorting, and indeed there is no end to the possible hallucinations and illusions which may be given to a subject. The writer appends one or two of his own experiments which may seem worthy of notice. The subject of these experiments was an Oxford undergraduate.

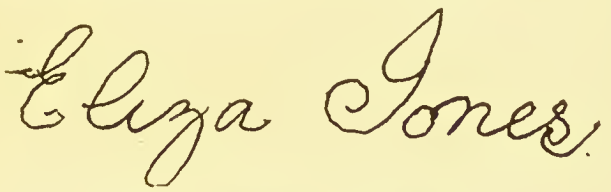

FIG. 6.—*Signature as a little Girl.*

FIG. 7.—*Written afterwards, by request.*

The first hallucination induced was that he was a little girl.

On waking, though his normal voice was somewhat deep, he spoke in a falsetto pitch and minced his words, whilst he sat in a chair, the type of meekness, with his hands in his lap. Some sentences were then dictated to him, with the result seen in the illustration (see Figs. 4 and 5). On another occasion, when under the same hallucination, he was asked to sign his name (Figs. 6 and 7).

Another suggestion was made to him later, that on waking he would find himself intoxicated. He was with difficulty induced to write at all, as he strongly wished to be "put to bed"; after much persuasion, we succeeded in obtaining the specimen of caligraphy shown in the facsimile (Fig. 8).

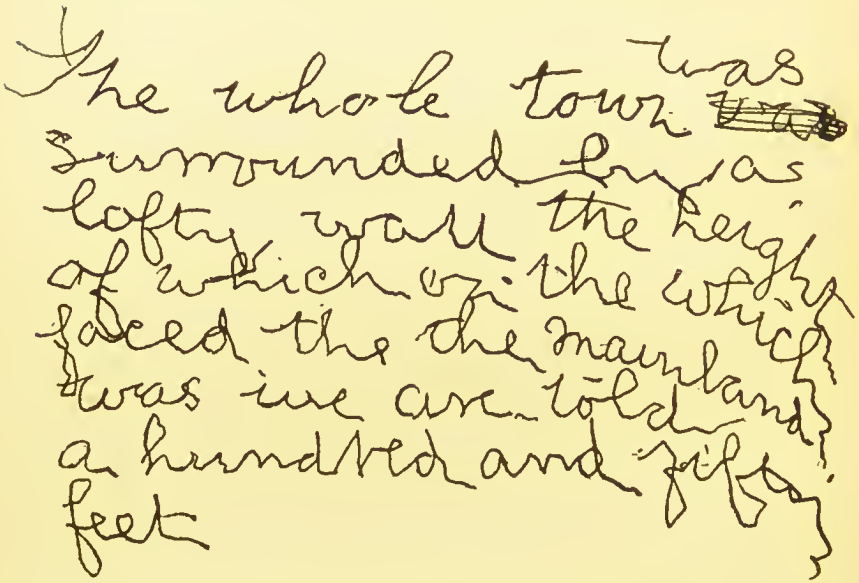

FIG. 8.— *Writing under Suggestion of Intoxication.*
(FIGS. 6, 7, and 8 reduced one-fourth.)

In all hallucinations of personality the person hypnotised will always "live up" to the character as far as his knowledge will allow. It is quite possible to make the subject believe he is some inanimate object, such as a chair, a carpet, a piece of window glass, etc. On its being suggested to one subject that he was a strawberry ice, he at once

became flaccid, and, as the room was hot, began to "melt," till he finally sank to the ground in a mass as amorphous as he could assume.

Very often an illusion given will result in what is termed "auto-suggestion"; for instance, a person hypnotised early in the afternoon is awakened in five minutes with the idea that it is seven in the evening. He says he feels hungry and wants his dinner.

If it be suggested that the operator's hand is a pistol, on his clicking his finger the subject will put up his hands to his ears and complain of the noise occasioned by the firing, the impression of which has been conveyed to his mind by the suggestion of his own intellect.

The following instance of a frequent phenomenon in post-hypnotic suggestion is notable. The writer suggested to a lady that when she awoke she should find that the floor was covered with tin-tacks and that she had no shoes on.

Immediately on waking, she huddled herself up in the chair and drew her feet off the floor. When asked the reason, she said there was "something sharp," and on being further pressed as to what it was, she said "pins"; this variation, slight in itself, is an illustration of the nature of the action of the hypnotic suggestion; the word "tin-tack" was lost, but the essential idea of the suggestion was in action. Binet et Féré point out that hypnotic hallucination has always the appearance of a

spontaneous symptom. On awaking, the subject obediently performs the act which he was ordered to do during the hypnotic sleep, but he does not remember who gave him the order, nor even that it was given at all. If asked why he is performing the act, he usually replies that he does not know, or that the idea has come into his head. He generally supposes it to be a spontaneous act, and sometimes he even invents reasons to explain his conduct. All this shows that the memory of the suggestion, so far as respects its utterance, is completely effaced.[1] This belief of spontaneity on the part of the subject is typical, and medical men, especially, who may have to do with some criminal charge connected with an alleged hypnosis should always examine carefully the statements of the person alleged to have been hypnotised. Any statement on the part of the person that he or she was "hypnotised" and "could not help doing it," or any similar statement, should be received with great suspicion. The statement that he was hypnotised, and the further statement that he cannot give any account of what took place, does not bear any internal evidence of untruth; but in all probability the subject would fail to see any connection between the crime and the hypnosis, and probably would not mention the fact that he had been hypnotised unless specially asked. Moreover, those pretending that they have been hypnotised generally think it neces-

[1] Binet et Féré, op. cit., p. 209.

sary to lay stress on some mysterious influence held over them. Such a statement as this we should receive in the same manner as that of a man who walks into the hospital with "a broken thigh."

Some of the results which are to be described may seem so startling that we can quite understand their being received, by some, with a certain degree of suspicion; and indeed, in all such matters, the more scientific mind will naturally demand to, at any rate, see these phenomena before they yield their absolute credence; however, it is not our present duty to convince any one, but only to record the facts.

Anæsthesia. In all the deep states of hypnosis, complete anæsthesia can be produced. The most powerful electric currents can be administered without the patient evincing the least sign of discomfort. Teeth may be drawn and stopped, and any surgical operation performed without causing any pain to the subject. The fact that this anæsthesia can be produced in all deep hypnoses, provides the experimenter with a ready means of demonstrating that there is no simulation on the part of the subject.

The *pulse*, *respiration*, and *temperature* are capable of great modification by means of suggestion.

Krafft-Ebing suggested to a patient that he was in a bath, and produced "goose-skin" by this means.

The hallucinations and illusions of sight are extremely various and interesting. It may be sug-

gested that some one in the room is another; the subject will accept the illusion that the hypnotist himself is some one else. The most complicated illusions can be successfully effected. The writer told a subject that when he awoke he would find a friend opposite him to be the Bishop of Oxford; that in three minutes later this same friend should be his college scout; then, after the expiration of a further three minutes, he was to find his own father sitting opposite; and, finally, that the father should be changed into a collie dog. Not only were these illusions perfectly carried out by the subject, but the time was observed with great precision, though he did not look at his watch, and there was not a clock in the room. A person, by suggestion, may be rendered invisible to the subject. Binet et Féré relate an instance of this, every detail of which the writer has often confirmed by experiments.

We suggested to an hypnotised subject that when she awoke she would be unable to see F——, but that she would continue to hear his voice. When she awoke, F—— placed himself before her, but she did not look at him, and when he extended his hand there was no corresponding gesture on her side. She remained quietly seated in the chair in which she had been sleeping, and we sat waiting beside her. After a while the subject expressed surprise at no longer seeing F——, who had been in the laboratory, and she asked what had become of him. We replied, "He has gone out; you may

return to your room." F—— placed himself before the door. The subject arose, said good morning, and went towards it. Just as she was about to lay hold of the handle she knocked up against F——, whom she was unable to see. This unexpected shock made her start; she tried to go on again, but on encountering the same invisible and inexplicable resistance, she began to be afraid, and refused to go near the door.

We next took up a hat, and showed it to the subject. She saw it quite well, and touched it in order to satisfy herself that it was really there. We then placed it on F——'s head, and words cannot express the subject's surprise, since it appeared to her that the hat was suspended in the air. Her surprise was at its height when F—— took off the hat and saluted her with it several times; she saw the hat, without any support, describing curves in the air. She declared that it was *de la physique*, and supposed that the hat was suspended by a string; she even got upon a chair to try and touch this string, which she was unable to find. We then took a cloak and handed it to F——, who put it on. The subject looked at it fixedly with a bewildered air, since she saw it moving about and assuming the form of a person. "It is," she said, "like a hollow puppet." At our command the furniture was moved about and noisily rolled from one end of the room to the other—they were, in fact, displaced by the invisible

F——; the tables and chairs were overturned, and then the chaos was succeeded by order. The different objects were replaced, the disjointed bones of a skull, which had been scattered on the floor, were joined together again; a purse opened of itself, and gold and silver coins fell from it.

We then induced the subject to sit down again, and we placed ourselves beside her chair, in order to subject her to experiments of a quieter nature. We shall see how she managed to explain certain facts, rendered inexplicable by her inability to see F——. That gentleman placed himself behind her, and while she was quietly conversing with us, he touched her nose, cheeks, forehead, or chin. Each time the subject put her hand to her face in a natural way, and without any appearance of alarm. We asked why she put her hand to her face, and she replied that it itched, or was painful, and she therefore scratched it. Her tranquil assurance was extremely curious. We begged her to strike out violently into space, and at the moment she raised her arm it was arrested by F——. We asked what was the matter, and she replied that her arm was affected by cramp. She was, therefore, never at a loss; she invariably explained everything, however insufficient the explanation might be.[1]

The increase of the faculty of sight which can be produced is a striking phenomenon. To one subject a blank piece of paper was given with the

[1] Binet et Féré, op. cit., p. 305.

suggestion that he should find thereon a column of figures. He said in reply to the question that he saw them. He was then asked to read them out, beginning from the top. The numbers which he read out are here given. The next request was for him to add them together and give the result: this he gave as 104. Asked to add the 1st, 4th, and 8th numbers (counting from the top) he replied, "35." The total of all the numbers consisting of two figures he gave as 65—an error of 2; he gave, however, the correct total (viz., 37) on being told to add together the numbers of one figure. Clearly, all this must have depended on the memory of the figures which he read out as seen by him on the blank sheet of paper.

8
6
10
14
9
4
18
13
5
12
3
2

On taking the paper away from him, it was found impossible to obtain any correct results; he was unable to name any of the numbers beyond the first two. Thus the mental illusion was intimately connected with the surface of the paper, and resulted in an identification of the various marks and lines on the paper, more or less invisible to the ordinary eye, but rendered plain to the subject by reason of the increase of faculty.

With the object of ascertaining the length of time it was possible for the hallucination to remain in its entirety an interval of half an hour was allowed to elapse; at the end of this time the subject said he clearly saw the figures when he looked at

the paper. In repeating them, he left out " 9 " and gave the number " 18 " as " 8." Several other experiments were then proceeded with, and after an interval of two hours he failed to get at all near the proper order, though he still confined himself to the numbers, and persisted in guessing until the paper was taken from him.

That in all such hallucinations the increased faculty of sight plays an important part is evident from the following experiment :—

A piece of manuscript paper is taken and it is suggested to him that it is a photograph. This sheet is then mingled with some fifty others of precisely the same shape, size, and form. The sheets are given to the subject, and he is told to find the photograph; he goes through the packet till he comes to the one on which it was suggested he should find a photograph. This he at once identifies.

When such facts as these are seen in hypnosis, the reader will easily understand how excusable were the theories of " clairvoyance," " prevision," etc., advanced by the early magnetists. The state, nevertheless, is a purely physiological one. If the piece of paper be turned round, the portrait is no longer seen; if it be turned upside down, the portrait is seen upside down also. All this, then, depends on the connection, held in the subject's mind, between the hallucination and the peculiar surface of the particular sheet of paper. Further still, if

all these sheets of paper be photographed, and the prints be submitted to the subject, he will be able to identify the photographic copy as well as the original piece of paper.

Ch. Féré records an experiment devised by himself. "We place a blank card on a blank sheet of paper, and with a blunt pointer, which does not, however, touch the paper, we follow the outline of the card so as to suggest the idea of a black line. We ask the subject, on awaking, to fold the paper in accordance with these imaginary lines; he holds the paper as far from him as it was at the moment of suggestion, and he folds it so as to form a rectangle, which precisely covers the card."[1]

Binet et Féré have made many elaborate experiments showing still more clearly (although they do not altogether admit this) that in all hallucinations of sight some exterior object is seized on by the eye as the external basis of the delusion. If, when regarding external objects, a prism be placed before one eye the objects appear double, and one of the images presents a deviation of which the direction and the extent may be calculated. During the hypnotic sleep it is suggested to the subject that a profile portrait is on a table of dark wood before him. On his waking, a prism, without warning, is placed before one eye, and he is astonished to see two portraits; not only this, but the position of the

[1] Les hypnotiques hystériques considérées comme sujets d'éxperienee, etc. Ch. Féré. Paris, 1883.

false image, in these cases, is in conformity with optical laws.

Similarly, an opera-glass brings imaginary objects nearer, or, reversed, makes them appear farther off. It will not make the object appear more or less remote, unless it has been adapted to the subject's sight.

Lastly, it may be suggested that an object is placed on a given point of a table, and if a mirror be placed behind that point the patient immediately sees two objects.

In obedience to the proper suggestion the subject will mistake the voice of some one unknown to him for that of a friend; or he will believe that, when a certain person in the room speaks, he barks like a dog, etc., etc. A simple hallucination can be induced by suggesting that, when all is silent, he shall hear the voice of a friend without being able to see him. One, thus impressed, maintained a disjointed conversation, asking questions himself and replying to imaginary questions.

The sense of hearing is frequently increased to an enormous extent by suggestion, under hypnosis.

A subject who could, in the normal state, only hear the ticking of a watch at a less distance than four feet, could, by hypnotic suggestion, hear it twelve feet away, and through a closed door.

Similarly, the slight clicking of a pair of microscopic forceps could be heard when the subject was at the extreme end of the room and the forceps

were in the next room. On one occasion some dozen gentlemen shouted continuously the word "Tom"; amidst all this din, another was, in a low voice, to utter the same word. The latter gentleman stood behind all the rest; so great was the noise that we only knew when he had spoken the word by the movement of his lips. The subject, however, who could not see the speaker, immediately detected the sound and called out, as he had been instructed to do. This word was repeated thirteen times, at different intervals, varying from twenty seconds to three minutes, and in every instance the subject detected the voice instantaneously.

A still more subtle experiment was tried. As everyone knows, in a whisper all individuality of voice is apparently lost. If any one will turn his back to some friends and get them to softly whisper in turn, he will find it impossible to discover who is whispering, as the peculiar *timbre* of the voice seems absent. Thirteen stood behind the subject, and they all, in turn, or out of turn, whispered the word "bother." The order was constantly varied, but it was impossible to deceive the subject, who recognised the whisper directly the one, mentioned in the suggestion, whispered.

The subject may be told that he is very fond of sugar sticks; if a candle be presented to him with the suggestion that it is a sugar-stick, he will proceed to eat it with relish; in the same way,

he may be told that some harmless substance, such as water, is nauseous, and he will evince symptoms of the greatest disgust on tasting it, and, in some cases, vomiting may ensue.

An experiment which the writer frequently performed at Oxford is the following:—A number of persons each take in their hands some small object, such as a penknife, a pencil case, a coin, etc. While the subject is still out of the room these articles are placed on the table, and the subject is brought into the room. He takes up the first object, smells it, and then smells the hands of the various persons till he comes to the owner of the object, when he leaves it in his or her hand, and so on, until he has settled the ownership of all the articles placed on the table.

Another evidence of this increase of faculty was given when the writer went, whilst the subject was out of the room, to some bookshelves and passed his fingers down the backs of several books. The subject, on returning into the room, smelled the two fingers, and going to the bookshelves pulled out the books which had been touched.

Many hallucinations of the sense of smell are possible. A foul odour can be suggested as sweet; and the subject will complain bitterly, under the proper impression, of the horrible smell given forth by a rose.

The next is an instance of auto-suggestion in which several senses, including smell, were involved.

A subject's attention was drawn to a bottle of ammonia on the table before him; it was then removed, whilst the suggestion was made that it was still there. He saw the imaginary bottle of ammonia in the original position, but was quite unable to see, smell, or in any way perceive the real one. The bottle, containing the strongest ammonia, was placed, with the stopper taken out, immediately under his nose, and the subject felt nothing.

It is known that the sense of touch is not so delicate, but that on certain parts of the body (*e.g.*, the back), the two points of a pair of compasses are felt as one point. According to Berger, a person, in whom a distance of 18 degrees was necessary to produce a twofold sensation in the normal state, was able, under hypnosis, to distinguish the points at a distance of 3 degrees. Very slight variations in temperature will be detected by subjects under hypnosis; and some curious results are obtainable by increasing the sense of *pressure* or weight.

Thus the subject is blindfolded, and a large horse-shoe magnet is brought within about an inch of his hand. He describes it as "something smooth," "heavy," "feels like metal"; on a book being substituted, he describes it as "not so heavy," "something rough," etc., etc.

Hallucinations of *Colour* and *Colour Blindness* may be produced. Parinaud, the head of the ophthalmological laboratory at the Salptêrière, has

summed up these in a paper contributed to Binet et Féré's work "Animal Magnetism," and a portion of this is quoted, though it must not be forgotten that these results are probably due to the hypnotic training which these authors have referred to.

"*Hallucinations of colour may develop phenomena of chromatic contrast as readily as, and with even greater intensity than, the actual perception of colour.*

"If, for instance, a piece of paper divided by a line be presented to a hypnotised subject, and it be suggested to her that one-half is red, the sensation of the complementary colour, green, occurs on the other half. If, after awaking, the sensation of red remain, so also does the sensation of green.

"In order to understand the meaning of this fact, I must refer to the following experiment, relating to chromatic contrast, which I communicated to the *Société de Biologie* in July 1882.

"A card which is half white and half green on one side, and wholly white on the other, is marked in the centre on both sides with a spot intended to fix the vision. For half a minute the eyes are fixed on the parti-coloured side, and then the card is turned and the eyes are fixed on the central spot of the white side. On the half which corresponds to the green half a red tint appears, which is merely the definitive after-image, and on the other half the

complementary green tint is seen. The after-image of red has, therefore, developed by induction the sensation of green in the part of the retina which had only received the impression of white. This experiment, which may be varied in different ways, so as to establish the fact that we have to do with positive sensations, and not with any error of judgment, shows that every impression of colour leads to a more or less persistent modification of the nervous elements which produce the after-image, and that this modification causes, in the parts not affected, a modification in the opposite direction which develops the complementary sensation." [1]

If a subject be told he is holding a hat in his hands, he will be unable to close them without using force, by reason of the resistance caused by the imaginary hat. It was suggested that there was a roll of tissue paper between his hands, and that he was to close them whether or not he spoilt the paper.

Here the difficulty was not great; when he held the imaginary hat it was greater, and on being told

[1] The point is whether there be an affection of the apparatus of vision, the retina and the optic nerve, or whether the image be a subjective one awakened as a memory in the visual centre and evoked by the subject's intellect. The experiments of Parinaud would show that the alteration was of the former description, but Bernheim has made an elaborate series of experiments demonstrating that the image is a *psychical*, and not a physical one. It does not pass by the peripheral apparatus of vision, has no objective reality, follows no optical laws, but is due to intellectual action. *Vide* Suggestive Therapeutics, 2nd ed., chapter vi.

that he was holding a brick, he made the most strenuous efforts to bring his hands together, and he at last gave it up as impossible.

Unilateral hypnosis.—All the hallucinations we have previously discussed have affected the whole personality of the individual. It has been shown that by means of auto-suggestion, if a suggestion affecting the sight be made, the other senses all act in harmony with the sight. The phenomenon of unilateral hypnosis presents, however, an exception to this rule. The hypnotist goes to the right ear of his subject, and says to him, "When you wake up, you will find the sun is shining brightly, and that the weather is perfect." He goes to his left ear and says, "When you wake up you will find it is raining hard, and that it is a dull, miserable day." On waking, the result is very evident, for the one side of the face will wear a smile, whilst the left side will present the appearance of annoyance. This experiment, however, will not always succeed.

The subject, acting under the proper suggestion, takes an umbrella and holds it on the left side, whilst he complains of the heat on the right.

The absence of any knowledge on the part of the subject that he is under any illusion, or that he is in any way obeying an hypnotic suggestion, is illustrated by the following experiment:—

A college cap was put in the lap of a subject, with the suggestion that when he awoke he would

find it was a little fox-terrier. Previous to hypnotising him, the writer had said that he was going to give him an illusion, and wished him to remember, on waking, that whatever he saw was due to a suggestion given him in hypnosis. The look of incredulous surprise, with which he regarded those present when they assured him that it was not a dog he had in his lap, but a college cap, was more than sufficient to show how completely the warning had failed to overthrow the suggestion.

"Not a dog," said he; "pray, then, what do you call it?" And on our taking up the tassel of the cap, he was angry with us for "pulling the dog's tail." He was then asked if he did not remember the warning before he was hypnotised, and was assured that it was a cap he had in his lap, and that he mistook it for a dog by reason of the hypnotic suggestion made to him. He looked at us with a puzzled expression for some moments, and finally laughed, saying, "You must have been hypnotised yourself, I think."

It is evident from the description of the many hypnotic phenomena, which, as we have seen, depend largely for their production upon the action of the intellect and the memory, that with regard to hypnosis it would be altogether misleading and false to speak of "unconsciousness," understanding by this term the psychological meaning—*i.e.*, a state in which no psychical process takes place.

It is equally clear, however, that though it be

inaccurate to speak of loss of consciousness in hypnosis, we have nevertheless to do with a singular and abnormal form of consciousness. Before entering upon a discussion of the etiological questions involved, the writer has endeavoured to give a clear account of the phenomena to be observed in normal hypnoses, and of the results of experimental variation. For, without an accurate and comprehensive knowledge of the nature of these phenomena, the discussion of the physiological alterations caused by the induction of hypnosis must be fruitless. The condition of the hypnotised person, the effects of suggestion, and the conditions and limitations under which the phenomena are to be produced must all be properly appreciated: and the psychical changes which may be observed are of especial importance in this respect. Much more experimental material might have been brought forward, but we have used no more than is necessary to illustrate the various phases of hypnosis.

CHAPTER IV

THE PHYSIOLOGY OF HYPNOSIS

Nature of nervous action—The nervous mechanism—Anatomical differentiation—Functional differentiation—Structure of cerebrum—The white and grey matter—The combination of neurons—Structure of a neuron—The spinal cord—Course of a motor impulse—The ganglionic system—The nervous mechanism of the various organs—The heart—Stimulation of the vagus—Division of the cervical sympathetic—The submandibular gland—The relations between the psychical and physical—Various kinds of nervous action—Inaptic, aptic, conscious—"Reflex" action—Experimental differentiation of actions—Interpretative and non-interpretative—"Automatic" actions—Unconscious psychical action—The basis of classification—Hypnosis in relation to psychology—Modification attending the induction of hypnosis—The mental function—The neuronic group—Inhibition—Suggestion in the normal state and in hypnosis—The course of the stimulus; its terminal dissipation—Hallucination—Memory—The place of hypnotism in scientific knowledge.

In order to obtain an accurate view of the relations of the hypnotic to the normal condition, it is necessary to have a clear conception of the nature of nervous action, of the structure and function of the nervous system, of the interdependence which exists between the various organs of the body and the central nervous mechanism, and of the character

of this interdependence. Many writers have given clear accounts of the nervous mechanism of the body; the distribution of the nerves has been described with an accuracy and detail, leaving nothing to be desired; but while one has concerned himself with the structure and another with the function, the meeting-place of the two seems to have been in some respects singularly neglected. The general conception of the nature and extent of nervous action is thus faltering and inadequate; our terms are vague, mean too little or too much, and are too often used with but a faint glimpse of their meaning. A general consideration of nervous anatomy would here be impossible, and in tracing the outlines of the distribution of the system in man, we shall do no more than is absolutely necessary for the purpose of the argument we wish to establish and for an indication of the paths by which a psychical stimulus becomes translated into a physical fact.

The human nervous system has a wide extension throughout the body, its ramifications blending with almost every structure; from anatomical and physiological points of view it is divided into distinct parts. The brain, including the cerebrum, cerebellum, pons Varolli, and medulla oblongata; the spinal cord with the peripheral nerves, and the ganglionic or sympathetic visceral chain. To the cerebrum belongs the functions of intellect, will, emotion, and, in fact, of all the great psychical pro-

cesses ; possessing these functions it necessarily has the control of the voluntary movements of the body, and coming to it, for its information, from the whole of the periphery are the varied stimuli derived from the outside world by the special senses of sight, hearing, touch, smell, and taste. Thus we have at once a marked differentiation of the functions of the brain into two sorts—(1) the psychical and (2) that connected with the issuing and receiving of impulses, and accordingly we find corresponding anatomical distinction. If we take a section through a hemisphere of the cerebrum, we find the central portion hard, comparatively resistant to the knife, dense in texture, and of a whitish appearance ; external to this is a convoluted margin, composed of a darker substance, soft to the touch, more easily friable than the white matter, and dipping with some irregularity into the white layer beneath it. The central white matter consists of the nerve-fibres coming from and going to the grey matter, and the difference of texture in this substance is due to the sheaths (the medullary sheath) in which the fibres are enclosed ; the darker substance (the grey matter) is chiefly characterised by the presence of large numbers of nervous cells, together with a certain proportion of medullated and non-medullated nerve fibres.

The fundamental component of the cerebrum is the combination of a multitude of neurons, the total number of which has been estimated at about two

thousand million. Each neuron is composed of a cell body, protoplasmic processes (*dendrons*), and the "axis-cylinder" process. The protoplasm of each neuron is distinct from that of every other, the only connection obtainable being by virtue of the proximity or contact of the dendrons. It is by means of these protoplasmic dendrons, which are a constituent of the neuron itself, that the impulses are finally conducted to the neuron, whilst the efferent impulses leave the neuron by the axis-cylinder process.

This process leaving the neuron gives off at intervals collateral branches which run at right angles to the process. The collaterals split up into the finest fibres which, with the dendrons of another neuron, form arborization (Fig. 9). The neurons and the dendrons constitute, as has been said, the grey matter of the brain, whilst the axis-cylinder processes are chiefly found in the white matter. The nerves must pass through various structures before reaching their termination; the impulses to the periphery pass downwards through the medulla oblongata to the spinal cord. And here there is a change in the relations of the grey to the white matter. Taking a cross-section of the spinal cord, which, however, varies somewhat according to the level at which the section is taken, we find the grey internal to the white matter; the white consisting as before of nerve-fibres, and the grey of neurons intermingled with nerve-fibres about to form arborescence around other neurons. Taking one-half of the section, we find

the grey matter forms an anterior prominence, very definitely marked and termed the *anterior cornu*, whilst the posterior portion, more tapering and somewhat less definite in character, is termed the posterior cornu. The afferent nerve-fibres (*i.e.*, the nerves going to the central nervous system from the

FIG 9.—*Diagram of a neuron with its dendrons and axis-cylinder process; the axis-cylinder process giving off a collateral branch, and at its termination breaking up into an arborescence with the dendrons of a second neuron.*

periphery) enter the posterior cornu, and leaving the anterior cornu are the fibres conveying motor impulses to the periphery. These nerves leaving or entering the cord form two separate bundles

known as the anterior and posterior nerve-roots, the posterior root bearing on it a ganglionic enlargement; the two roots then become united into one large nerve trunk, containing both afferent and efferent fibres. The nerve fibres do not enter or leave the cord at the level at which their fibres enter or leave the grey matter, and thus there is outside the grey matter of the cord the white matter consisting of medullated nerve-fibres.

We may now be able to trace the course of a motor impulse starting from the cerebral cortex. Starting from a neuron, it passes down the axis-cylinder process; this process now crosses to the opposite side of the cord, and at a certain level passes into the grey matter, where it breaks up into an arborescence round the dendrons of a neuron: from this neuron an axis-cylinder is produced, which passes down a nerve-trunk, and finally breaks up in the muscle which it supplies. It is thus easy to perceive the elaboration of the mechanism involved in a single movement. As we have seen, the distal axis-cylinder gives out collateral branches which arborese with other neurons, whilst the termination of the first axis-cylinder is not in a muscle, but in a second neuron similarly surrounded with arborescing fibres; and from this neuron the second axis-cylinder proceeds, giving out before leaving the cord other collateral branches. We are able, therefore, to see that for the simplest movement the combination of many neurons is

necessary, and a specific movement is brought about by the specific combination of these neurons, the activity of which is requisite for the performance of the movement.

The course and distribution of the sensory nerves need not here be described, since, though differing in detail, the principles underlying their structure and course are essentially the same. For the same reason we have not discussed the course of the cranial nerves; there is, however, one special branch of the nervous system which plays so important a part in the adjustment of the organs to the immediate requirements of the organism that a short description may be useful. The "sympathetic" or "ganglionic" part of the nervous systems consists of (1) a series of ganglia connected together by intervening cords, extending from the base of the scull to the coccyx, one on each side of the middle line of the body, partly in front and partly on each side of the vertebral column; (2) of three great gangliated plexuses or aggregations of nerves and ganglia, situated in front of the spine in the thoracic, abdominal, and pelvic cavities respectively; (3) of smaller ganglia situated in relation with the abdominal viscera; and (4) of numerous nerve-fibres. These latter are of two kinds—*communicating*, by which the ganglia communicate with each other and with the cerebro-spinal nerves; and *distributory*, supplying, in general, all the internal viscera and the coats of

the blood-vessels. By means of this distribution every organ and gland in the body is governed and regulated. The distribution and course of the ganglionic system is elaborate and complex, and for an adequate description of the anatomy of the nervous system the reader is referred to the anatomical works (Quain, Gray, etc.). On anatomical grounds, therefore, we have every reason to assign to the nervous system functions much higher than those involving the mere conduction and dissemination of impulses; from the specific combinations of neurons already referred to, from the presence of multitudinous ganglia, and from the elaboration of the system, we have evidence of a mechanism which is selective, purposive, and adaptive in its functions.

We may now consider the method of action as regards the organic functions, since, without a knowledge of the nature of these processes, we shall not be able to realise the nature of the changes induced as a result of hypnotic suggestion.

To consider the nervous mechanism of each organ in detail would be an unnecessary labour, and we, therefore, may select a few examples, from which a clear idea may be gained of the general characters of the methods by which each part of the body is regulated to meet the demands made on it. Selecting, then, the heart as the most important organ, we may briefly discuss the paths of innervation and control as demonstrated by experiment on various

animals. The heart is constantly regulated to the organic needs mainly through two channels; the sympathetic system conveying to it the accelerating or augmenting impulses, whilst the inhibition of the heart is maintained by the nervous impulses passing down the vagus nerve. At first sight such a double mechanism as this might appear unnecessary; it would seem simpler for the heart to have been provided with merely an augmenting mechanism, which should serve for the occasion when undue exertion on the part of the heart was called for; but it is, in fact, the inhibitory apparatus which plays the more important part, and which, throughout the body, has the more powerful and striking influence. Thus, under normal circumstances, the heart is working at only a comparatively small percentage of its real power, being restrained by the constant inhibitory impulses reaching it through the vagus, so that on some further effort of the heart being required, this is not provided for so much by an exhausting series of augmenting stimuli, which would correspond in some degree to the flogging of a wearying horse, but by the adjustive withdrawal of inhibitory influences; thus permitting the heart to respond to the calls made upon it without undue strain. We shall find that this action of inhibition has a profound influence on all the functions, from the most physical to the most psychical; and as the etiology of hypnosis largely depends on the alteration in the

nervous balance of inhibitory impulses, we must refer to certain experiments in this direction.

If the vagus nerve in a frog be stimulated by means of an interrupted current, the normal beating of the heart will be interrupted, the heart ceases to contract, and the heart-muscle is completely relaxed; on the withdrawal of the stimulus the heart begins to contract, at first feebly, but in a short period with greater strength than before the stimulation; and this experiment may be repeated many times with precisely the same result (Fig. 10). We here have a clear demonstration of the

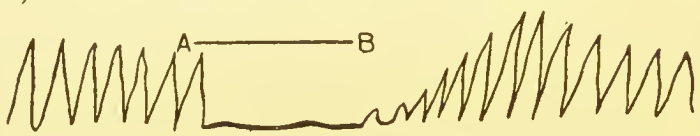

FIG. 10.—*A tracing of the heart-beat of a frog taken by means of a lever attached to the heart; at* (α) *the peripheral end of the vagus is stimulated by means of the interrupted current, at* (β) *the stimulus is removed.*

nature of impulses passing down the vagus to the heart: they are not impulses of a motor or innervating character, but perform the function of a regulatory inhibition.

Two experiments may be quoted as indicative of the nervous control of the whole of the vaso-motor system, and of the process of secretion. The regulation of the blood supply to a part, and consequent, to a great extent, of the activity of that part is maintained by a compensatory mechanism similar to that of the heart. If, in a rabbit, the

cervical sympathetic be divided, the vessels on that side of the head dilate, the whole of the region affected becomes engorged with blood, and the temperature is raised. On stimulation of the central end of the divided nerve, the dilated vessels contract, the engorgement disappears, and the temperature returns to normal; the sympathetic system

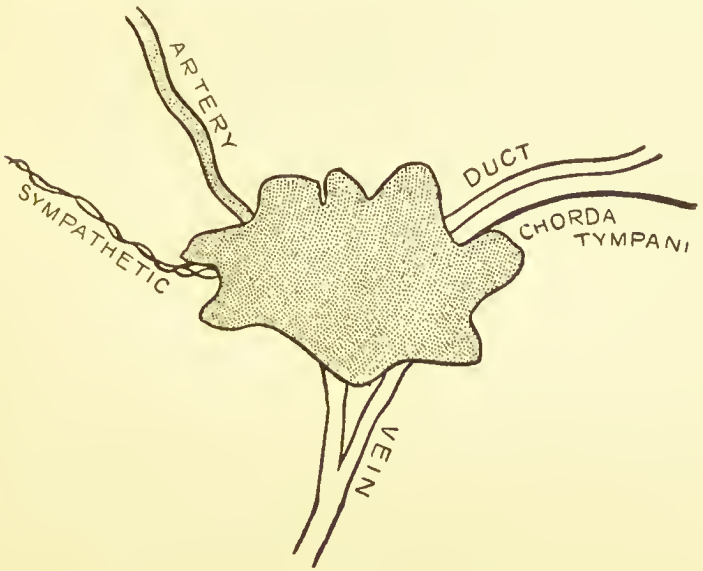

FIG. 11.—*Diagram representing the nervous and blood supply of the submandibular gland of the dog.*

is thus seen to exert a constrictive action on the blood-vessels, thus maintaining a *tonus* and, consequently, an adequate blood-pressure. The most convincing experiments have, however, been performed upon the submandibular gland of the dog. As represented in the diagram (Fig. 11), the

nervous supply of this gland is derived from two channels—the chorda tympani and the sympathetic. If the chorda tympani be divided, on stimulation of the peripheral end, a copious secretion from the gland ensues. The copious secretion thus obtained from the duct is clear and liquid. Simultaneously with the increased secretion the gland itself becomes hyperaemic, the blood-vessels dilate, and the blood-flow is more rapid; thus the chorda tympani contains fibres from a vaso-dilatator neuronic group, and other fibres from a secreto-motor group. On the other hand, when the cervical sympathetic is stimulated the arteries are constricted, the escape of blood from the veins is small, whilst the secretion of the gland is scantier and altered in character, being much more viscid and more albuminous. The sympathetic thus contains fibres from a vaso-constrictor group, and other fibres from a secreto-motor group. If the chorda tympani and the sympathetic be stimulated together, then the alteration and the secretion partake of both characters, the secretion being fairly copious in amount and viscid in character.[1] With the above as a rapid survey of the nature of the proximal mechanism, we may now proceed to a discussion of the higher mechanism involved in the origination or interpretation of stimuli—of the relations between the psychical and the physical.

[1] For a fuller and more adequate discussion of the subject the reader is referred to Foster's "Text-Book of Physiology."

Let us at once explain that by the term "psychical" we do not desire to endorse any of the various ideas connected with the word "soul"; we use the word simply to represent the non-physical aspects of nervous action. The various ideas connected with the "mind" and the "soul" are very confusing; but even as an hypothesis the doctrine of the soul would lend us no assistance, but would only needlessly involve an already complex question. We shall then regard the mind as one of the functions of a certain part of the nervous system, and, indeed, it will become evident in the course of discussion how impossible it must be to essentially separate the psychical processes from the physical. Yet in endeavouring to place before the reader a systematic view of the relations of the various forms of nervous activity, we shall have reason to differ from the teaching of the accepted schools of physiological psychology, and it is only just to the reader to say that though the theories here advanced have not been put forward without consideration, they fail to harmonise with the conclusions of many of the leading authorities in material respects.

The various kinds of nervous action may all be classed under three heads:—

1. Acts, constant, unmodified by reason of special adaptation to altered environment. *Inaptic.*

2. Acts, accompanied by adaptation to altered environment; purposive; unassociated with a conscious process. *Aptic.*
3. Acts, associated with a conscious process.

The student of physiological psychology regarding this classification from the accepted standpoint will at once notice that the differential elements vary from those usually put forward as the criteria of classification, and, moreover, he will hardly be prepared to sanction the disappearance of the one term more relied upon than any other, viz., the term "reflex." Our reasons for this alteration will appear in the course of the argument.

The first class of nervous actions may be represented by the action which follows irritation of the cornea; the eyelid immediately closes; the action is altogether independent of consciousness; volition has no power to prevent it; it is a definite muscular response to a definite stimulus; so long as the nervous mechanism is intact it will occur, entirely independent of and beyond the control of the individual. The second class includes actions which are more complicated and are adaptive. Moreover, an essential feature in this class is the presence of more or less elemental psychical action. Inasmuch, however, as the possibility of psychical action without consciousness is energetically denied by many authorities, we shall reserve the description and discussion of this special elimination till later. The

third class comprises all those actions of which a conscious process is an essential feature. We have avoided the term "reflex" action; not indeed, that we are unwilling to use it when properly applied, but for the reason that reflex actions do not belong exclusively to the class of inaptic actions, but to all three classes, and to none more so than the class comprising the acts of consciousness. The most important point of our discussion will necessarily turn upon the fundamental distinction existing, in the writer's opinion, between the inaptic and aptic classes of action, and inasmuch as this distinction is not generally admitted, we must refer to experiments illustrating this differentiation. If we destroy the brain of a frog as far down as the medulla oblongata, leaving the animal otherwise intact, we shall have an animal in whom all the nervous reaction to be obtained by experiment must necessarily take place in that portion of the nervous system not destroyed, *i.e.*, the spinal cord and the peripheral nervous system in connection with it. With the animal in this condition we can readily obtain the class of actions called "reflex." If the tip of any toe of the right foot be pinched, the right leg is immediately drawn up; if a toe of the opposite foot be pinched, then the opposite leg is drawn up. Now this is a constant simple reaction to stimulus; it is a physical property of the nervous mechanism existent in the spinal cord; the nervous system takes no cognisance of its

adaptation to the circumstances; so long as the same stimulus be applied, so long will this act take place, "constant and unmodified by altered environment." It is a type, therefore, of the *inaptic* class. On elaborating the experiment, we notice the same constant reaction to stimulus as before, but we find that the *conditions* of the animal to its environment will effect the response of the brainless frog. A small piece of paper is moistened with glacial acetic acid and is applied to the skin on the inner side of the thigh; the leg on this side is at once violently drawn up, and the foot of the leg is swept over the spot where the irritation is *so as to remove the paper*. Now place the paper, moistened as before, on the side of the frog and hold the leg on the same side; at first, the frog will attempt to free this leg in order to remove the irritant; then, realising this is impossible, he struggles to remove it by means of the other leg, and after possibly several futile attempts, succeeds. Are these last two actions merely complications of the one first quoted; are they essentially the same, or can we name any fundamental distinction existing between them? The answer to this is highly controversial and varies according to the position taken up by the various writers. Ziehen, to whose work[1] the reader is referred for a very able and lucid exposition of the opposing argument, takes up a position which, in

[1] Introduction to the "Study of Physiological Psychology." London, 1897.

the writer's opinion, is altogether fallacious from his persistence in refusing to any nervous process the name or function of "psychical" unless it be accompanied with consciousness, a position which, however widely it may be held, appears to us to be founded on an altogether gratuitous and confusing assumption. In the case of the brainless frog, there can be no consciousness; there can "therefore," be no "psychical" processes taking place, consequently all the phenomena are physical in nature; that part of the nervous system still intact can have no perception of altered conditions; still having no perception of altered conditions, it *does* alter its reactions. We are told that the actions are due simply to a complication of reflex processes. This "complication," however, begs the question, for what we have to decide is the reason for these complications. No one will deny that the movements in the last experiment are more complicated than those in the first.

We must then discuss the reason of this complication, and in doing so, we must necessarily examine the position of the opposite school. To the question whether there can be any intermediate stage between the physical and the conscious states of the nervous system, Ziehen gives a decided answer. "*All* and *only* the phenomena which are imparted to our *consciousness* are psychical . . . The sensation of sight itself is psychical in so far as it affects our consciousness"; and again: "'Psychical' and 'conscious'

are for us, at least, at the beginning of our investigations, identical." Now, all this depends on the meaning that we attach to the word "psychical," and let us say at once that, whilst all the higher psychical processes are necessarily part of a conscious process, yet the essential qualities of a psychical process do not, in our opinion, require the co-existence of consciousness. Any function which has to do with *interpretation* of impulses cannot be classed in the same category with a reaction of a merely physical nature, even though, as we are willing to admit, the interpretative function is equally a reaction to a stimulus; indeed, consciousness itself is such a reaction; but whilst in the case of the physical reaction we have nothing more than the simple unmodified reaction, in the case of the interpretative reaction we have a new element present, depending on the interposition of an agency quite foreign to the physical reaction.[1] So obvious is this that Stirling,[2] who describes the various experiments with the pithed frog, puts them under two headings. The simple withdrawal of the leg on pinching the toe he includes in the heading "Reflex

1 Bastian has recognised the character of certain "reflex" actions, speaking of them as resulting from unconscious *cognitions*. "There goes on, as it were, an organisation of intelligence primarily of the organic or unconscious kind, which is the hidden cause of the purposive character displayed by so many movements."—"The Brain as an Organ of Mind."

2 "Outlines of Practical Physiology." 3rd edition. London, 1895.

Action"; whilst the removal of the irritant is placed under the significant heading "Chemical Stimulations—*Purposive Characters of Reflex.*" In a work dealing with the purely practical and experimental side of physiology this is somewhat curious, and the reference to the "purposive characters" would appear to indicate that in a greater or less degree the writer draws some distinction between the two classes of actions.

It might appear at first sight wiser to introduce an intermediate term and thus avoid the confusion caused by using the word "psychical" in a manner different from that of other writers. And since there is a real distinction existing between a conscious and an unconscious act, we have referred the unconscious psychical process to the *aptic* class. But in this class the psychical feature is always present in a more or less elemental form, and consequently the term is common to the aptic and the conscious actions.

The actions comprised in the aptic class are so various that in the present state of our knowledge it is almost impossible to give an accurate definition which shall neither exclude too much nor include too little; yet in the case of a typical inaptic action of the first class and a typical aptic action there can be little difficulty in arriving at their classification. If we find an action which must have required for its performance a perception of the present environment, an estimation, more or less complete, of the

circumstances under which the action is to be performed, and a modification of the action to meet the existing conditions, then, since we cannot conceive the qualities of perception, estimation, and deduction as physical qualities, whilst on the other hand they definitely correspond with our conception of the immaterial nervous phenomena, we consequently can only classify them as psychical.

So prominent is the differentiation of these processes that the writers seeking refuge in "reflex action" have found it necessary to provide some way out. Ziehen quotes two experiments performed by Goltze, which well illustrate the difficulties under which the advocates of "reflex action" labour. "If after having removed the cerebrum of a frog we touch the cornea of the brainless animal with a couching-needle, the first reflex motion is the closing of its eyelid. If we repeat or intensify the stimulation the animal will strike the needle aside with the corresponding front foot. A still further increase causes the head and trunk to be turned away from the irritant. Finally, upon constantly increasing both the frequency and the intensity of the irritation the animal will retire to some other place." Now if similar responses had taken place, say, in a healthy boy with an intact nervous system, could we class these as physical reactions? Yet in the case of the frog, because the cerebrum has been removed, we are to argue that there can be no consciousness; without consciousness there can be no

psychical actions, and consequently the whole process is one corresponding with the simple physical reaction to a simple stimulus—the whole argument depending upon the fallacious identification of consciousness with psychical activity. Still even the erroneous limitation of "psychical" has to give way, and Ziehen in describing the next experiment takes refuge in the descriptive but question-begging term, "automatic acts or reactions." A frog is taken and its cerebrum destroyed, leaving the optic thalamus intact. A prick on its foot easily causes it to leap off. "If we place an obstacle in the path of its retreat it avoids the obstruction, or, in rare cases, clears it with a well measured bound." Whatever *name* we care to give to these processes they are essentially adaptive; they connote the elements of perception and deduction. As examples of psychical action without consciousness we can quote almost innumerable examples in ourselves. For instance, we may take the common instance of absent-mindedness, where the consciousness is fully occupied with an idea and cannot, in consequence, respond for some little time to another stimulus. Whilst in this absent-minded condition the person is addressed by a friend; at the time he gives no sign of having heard the remark; after an appreciable interval his consciousness is affected, and he replies. Between the time of the remark and the time of the reply, what has taken place? The stimuli afforded by the spoken words have been

transmitted to the proper group; the exact nature of the stimuli has been appreciated; the memory has identified the words and supplied their meaning; all this must have happened at the moment, for the auditory stimulus could not well gain a reaction when the stimulus had ceased to exist; thus without any conscious process the stimulus has been received and appreciated; after a period of shorter or longer duration comes the action due to the conscious process, without which the reply could not be formulated. To quote other examples would be to fill our pages with unnecessary material, since phenomena of a similar nature will readily occur to the reader—*e.g.*, the playing of an instrument, the consciousness being engaged in some other direction; the performance of elaborate movements without any distinct consciousness of their performance, yet all of them dependent on some of the most psychical of combinations as the combination of perception, memory, and the like.

The views here put forward with regard to the nature of nervous action thus differ, in material particulars, from any of the current theories. Now we may briefly summarise the distinctions. The views depending upon the assumption of an "entity" inhabiting the body, and commonly called the "soul," must be at once dismissed, since, in their origin and advocacy, they do not depend on scientific investigation; the argument as to the necessity of a "soul" for the production of thought

is equally applicable as an argument for the existence of a "soul" controlling and supervising the processes of gastric digestion; moreover, it is only as we have been able to rid ourselves of this and similar superstitions that any progress has been made in the study of the mental processes.

The only method by which we can arrive at a sure knowledge of the etiology and physiology of nervous action is by a study of the organ to which this function belongs. We thus rely entirely on the psychology which is physiological in its arguments and methods; when, however, we come to examine the details of the processes in this manner we are bound to differ from many of the writers on physiological psychology in matters of moment, though, at the same time, we would acknowledge the great and lasting value of their work. And the first point on which we join issue is in their method of regarding and treating what they term "Reflex action." The use of the term is to express the *constant* reaction to a stimulus; to the same stimulus there will be the same reaction. The experiment may be repeated a hundred times and the same result will be obtained. Therefore, because of this constant reaction to a constant stimulus, the simple actions, such as the one above referred to, are classed as "reflex." But such a limitation is altogether artificial and confusing; so far from such a reaction being limited to the simple movements, the law of a constant reaction to a constant stimulus applies with equal

force to the highest cerebral functions. When we see a friend—can we help seeing him? Why, because the response to the stimulus is in a conscious process, should we exclude it from the class of reflex actions? The stimulus is present, the reaction to the stimulus is present, and the relation is constant. When we hear a piano-organ, we recognise the sounds and their origin, though we do not see the instrument or the player, and we cannot help recognising them; we find it impossible to avoid the effects they produce on us. The higher cerebral processes, it is true, are much more complicated; each state of consciousness is modified by stimuli belonging to the present environment, which can probably never be repeated in their exact order, number, and rotation; but each separate stimulus produces its separate response, and for every one that we can isolate we can obtain the same evidence of a constant response to a constant stimulus. Therefore, not some, not many, but *all* nervous actions are "reflex" actions. If, however, we thus include all the nervous processes within this term, it must lose all its value as a classificatory term for certain of the elementary functions, and this is the reason for its avoidance in our suggested classification. Thus with regard to the etiology of the phenomena, our position is simple; whether or no the action corresponds to any one of Ziehen's three classes ["(1) Motions constant and generally following; results from one or more external stimuli—no

psychical correlative. (2) Motion modified by one or more intercurrent stimuli; generally following —no psychical correlative. (3) Motion results directly or indirectly from one or more external stimuli; modified by the association of intercurrent sensations and ideas; generally following—with psychical correlative"] they all obey the same law of constancy; the precise response depending on the part stimulated, the paths through which the stimulus passes, and the point at which it terminates.

In the preceding, therefore, we have sought to classify the actions, not according to their ultimate etiology, which is essentially the same in all, but according to the nature of the processes involved in the response made to the stimulus.

If the response be one which is "physical," *i.e.*, giving no evidence of modification due to the external environment, we include it in the elementary class of nervous action—*the inaptic*. If the response be of such a nature as to show that there has been a modification due to the environment of the moment, but without consciousness, then we have an easily appreciable distinction as our basis for a second classification—*the aptic*. Finally, if the response be associated with a conscious process, we again have a real and definite distinction upon which to rely for the third and last class.

But the student will readily perceive that our distinction between the first and second classes,

whilst definite enough in many marked cases, is certainly vague in others. Indeed, we admit at once that taking all the actions belonging to cases 1 and 2 together, it would be very difficult, if not impossible, to definitely relegate some actions to either class; there would remain a certain percentage of indeterminate phenomena. Admitting this, we cannot pretend that the classification is a perfect one. Still further, when we consider the terms "unmodified by reason of adaptation to altered environment" we may meet with the criticism that in the simplest cases we cannot materially alter the environment so as to affect the response, without at the same time altering the stimulus. Again, perhaps we should regard the simple "reflexes" as adaptive; unquestionably they are of service to the organism; the loss of the "corneal reflex" may and often does result in serious injury to the eye; the withdrawal of the frog's foot on pinching it may also be considered as adaptive; but all this is probably developmental in its origin and can be so explained; then there are many "reflexes" of no use to the organism, though equally of developmental origin, as for example, the gluteal, cremasteric, abdominal, epigastric and scapular "reflexes."[1] So far, therefore, as this class of actions is adaptive or "fitting," they are so from developmental consideration, and not from any

[1] For a description of the various "reflexes," see Foster's "Text-Book of Physiology," Part I.

spontaneous recognition of and adaptation to the present environment; whereas a typical aptic action is characterised by the recognition of circumstances which require to be taken into account. For our purpose it matters little as to the exact point at which we may deny or admit the interposition of an unconscious intelligence, so long as we recognise that amongst the functions of the nervous system one of the most important parts is played by this unconscious intelligence. So much in observation and experiment is conclusive in this direction that we make little apology for the intrusion of the term—unconscious psychical action.

So far, we have relied mainly on experiments conducted on animals; but if we are to pursue our studies in direct application to human psychology it is above all things necessary that we should experiment on the human subject. And in this direction the most promising field is in the study of the hypnotic state; for here we have a condition which is a remarkable deviation from the normal condition, yet in which every action performed in normal life can equally be performed. Psychologists have profited but little from the opportunities open to them for various reasons; the experimental use of hypnotism requires a good deal of practical experience and a precise knowledge of the condition; physiologists being, as a body, devoid of this practical experience, have put forward theories which are evidently the results of casual and inexact observa-

tion, and not infrequently appear to be founded on their knowledge of the normal nervous processes rather than on any actual knowledge of the hypnotic state.[1] Having dealt in as brief a manner as possible with the structure and function of the nervous system, regarded as a whole, we shall now turn our attention to the modifications effected by the induction of hypnosis, with especial reference to the physiology of the modifications thus induced. The phenomena of hypnosis we discuss separately, and we shall only refer in this instance to such of the phenomena as may be necessary to the course of the argument.

The attention of physicians and physiologists has been directed towards what is termed the influence of the "Mind" upon the "Body," and in numerous works we find references to the effects of "suggestion" in the waking state; still further, we recognise the effects of emotions on the normal process, the effect, for instance, of fear in preventing the

[1] A curious evidence of this may be found in the following quotation from one of the medical text-books of physiology which, in most respects, is an excellent work. The opening sentence suggests the explanation:—"It is not possible at the present day to conclude any account of the action of the central nervous system without reference to the phenomena of hypnosis. . . . Fixed attention and obedience to stimuli are, in fact, the essential elements of the hypnotic state in man; as . . . in the hypnotic state the cerebral pre-occupation is excessive . . ." The confusion between the phenomena of the induction of hypnosis and of the state itself is complete; whilst it would be difficult to write a more inaccurate description of hypnosis.

flow of saliva; the effect of nervous emotion on the gastro-intestinal tract, and many others. In a vague and unsatisfactory way these are classed as examples of a condition in the body sympathetic with that in the mind. These theories involve a misconception of which it is difficult to get rid. In our description of the anatomy and distribution of the nervous system no reference was made to any distribution of neurons or fibres whose function, pure and simple, was mental. So far as our anatomical and histological knowledge of the nervous system goes, we can point to no group which does not either receive sensory impulses or from which motor impulses do not emanate. Indeed, if from anatomical considerations we were to attempt a localisation of the mind, we should rather place it in the arborescing dendrons than in any other situation. But so far from seeking to attempt any such localisation of the mental functions it will be seen that we have every reason to believe that there is no such separation physiologically considered. Thus the neuron which receives the sensory stimulus, the neuron which discharges the motor impulse, and the arborescence connecting the two, are also psychical in function, either separately or as a group. This conclusion is not derived from that fruitful source of error, introspection, but partly from a consideration of the structure of the nervous system, partly from a consideration of the normal nervous phenomena, but chiefly from the writer's

study and observation of the hypnotic phenomena. If there be any reason for the opinion above expressed, the importance of a knowledge of nervous-anatomy will be easily realised, and it will be essential to bear in mind the anatomical and physiological details referred to in the earlier parts of this chapter.

The group of neurons must then be regarded as an organic unit capable of sensation, ideation, emotion, volition, and motion, in other words, capable of psychical and physical activity. With this group some others are in arborescent connection. We have at once on this conception a clearer view of the phenomena of the nervous system; emotion betrays itself in muscular movement, as movement betrays itself in emotion; the psychical actions of the organism correspond with the physical, and the physical actions with the psychical actions of the organism, not because the one acts on the other, not, therefore, because of the influence of the "Mind" on the "Body," but because the processes are the results of the neuronic groups in action.[1]

Here, however, we must indicate the limitations which govern the action of the group, for, though well acquainted with the muscular element of consciousness, we are equally familiar with the idea,

[1] This theory differs from that put forward in the various works on the psychology of the emotions. Equally from those who regard the psychical as the essential, and those who, in the ascendant at present, regard the psychical as but the result of the physical—*Vide* Ribot. "The Psychology of the Emotions," and others.

the *reflection* or thought which causes no appreciable physical reaction, and with the movement which is unassociated with a conscious process; for the laws of inhibition apply with equal force to the nervous system itself, and the following examples illustrate this. In the case of a severe fright the stimuli are so strong, and produce such a violent reaction, that the ordinary inhibitory forces are not strong enough to meet the case; the inhibitory power is withdrawn from the general system and centralised upon the higher cerebral groups; concomitantly with this withdrawal of inhibition, the heart, no longer restrained by the retarding inhibitory influences passing down the vagus, beats more rapidly and more strongly, and we have the "thumping" heart as a consequence of this withdrawal. Again, in the case of diseases causing an atrophy of the nervous tracts leading from the brain, and consequently causing a shutting-off of the inhibition, the "reflex" actions are increased, and others are developed, which in the normal subject are not present.[1]

In the case of the neuronic group we have a twofold phase of inhibition: the physical and the unconscious psychical arc restrained within their paths, so that with normal stimuli their reactions will correspond completely to the stimulus; the energy represented by the stimulus will have entirely

[1] As in spastic paraplegia with increased knee-jerk and with ankle-clonus and rectus clonus present.

disappeared in the unconscious sphere, and there will be in consequence no disturbance of the conscious elements of the group. Should, however, the stimulus be too strong to be dissipated in this manner, then the consciousness will be affected according to the degree of excess in the stimulus; in this manner we may have, (1), a stimulus causing action belonging to either the first or the second class of nervous actions (pp. 167-168). (2), A stimulus, which, being in excess, is dissipated in an affection of the consciousness. (3), A violent stimulus, the excess of which is so great as to affect the consciousness violently. (4), A stimulus which tends to affect the consciousness first, and does not directly cause physical or unconscious psychical reaction, unless in excess (*e.g.*, special sensation). In this manner we might easily multiply the possible varieties, thus two stimuli may be combined, as for instance, (1) and (4), and the consciousness is affected by the sensation of touch, whilst the other actions are accompanied by no conscious process.

We have, therefore, a very delicate mechanism kept in adjustment by inhibition; in the normal state, subject to withdrawal and increase of the inhibitory impulses, and with momentary variations in the balance between the processes attended and those unattended with consciousness. In the nervously irritable we have a condition of weak inhibitory power, with the result that normal stimuli produce abnormal reactions; the balance may be

altered by means of drugs, such as alcohol, cannabis indica, and in various conditions such as sleep, coma, etc., so that we are well acquainted with conditions in which the normal balance is more or less interfered with. The interference may be quite within physiological bounds, or, in its nature and degree, may become a pathological condition. From a consideration of the phenomena we shall be easily able to deduce the purely physiological nature of the modifications induced in normal hypnosis.

In the account of the phenomena of hypnosis in an earlier chapter, stress was laid on the change which occurs in the hypnotised subject apart from the effects of suggestion (p. 98). The changes in the pulse and respiration are comparatively trivial, since they may occur in many normal conditions, but the altered condition of the consciousness is exceedingly important. The disappearance of normal irritability, the acute passivity, and the lack of attention to the external on the part of the subject, are all evidences of a profound change in the nervous system. This alteration is spontaneous; it has not been caused by the action of drugs or by increasing or decreasing the metabolism of any particular portion of the nervous system, but has resulted from a cerebral change produced as a result of the various stimuli brought into action in inducing hypnosis.

All this has been brought about as a consequence of the abnormal form of inhibition induced, which

tends to limit the action of the higher psychical functions to the least degree possible, and this is still true, even in the case of hallucinations and the effects of other suggestions which might appear to be due to an increased ideation.

Most of the theories propounded in explanation of the phenomena of hypnosis have been put forward by physiologists who, however eminent in the branch of science which they have studied, have apparently not had opportunity of systematically observing the hypnotic phenomena. The commonest and the most improbable is the theory which assumes a psychical exaggeration; the subject is "preoccupied" with the idea given to him by the suggestion; so increased are his powers of ideation that the developments of the idea are manifested in every direction; he is told he sees till he *believes* he really does, and so forth. This theory, put forward in many ways and with various modifications, is, in the writer's opinion, untenable. Whatever may be the cause of the hypnotic phenomena, we are assured that any explanation proceeding on these lines is wide of the mark. The symptoms in hypnosis when accurately studied point in quite the opposite direction. If we say to a person in the normal condition, "Your left arm is stiff; you cannot bend or move it," we may cause amusement or surprise in the individual, but the arm is as capable of movement as before, and remains in every way normal. If, on the contrary, we make such a suggestion to a person

in a moderately deep hypnosis, the effect is markedly different; there is no evidence of surprise or any other emotion on the part of the subject; he does not reply, and from the appearance of his features he does not appear to have heard the remark; as far as his general appearance gives us any information, his consciousness has not been affected by the words spoken; but, on the other hand, the arm *is* affected; it is quite stiff, immovable by any muscular contractions of the subject's muscles, and only with great difficulty to be moved by another person.

So far, then, as the higher cerebral functions are concerned, the excess is all in the normal person; it is the physical reaction which is here distinctive of hypnosis.

Having previously demonstrated the play of inhibition in the psychical as well as in the physical functions of the brain, we are now in a position to represent physiologically the differences in the course of the suggestions in the two cases. Taking the case of the suggestion of stiffness of the arm made to the normal person, the distribution may be represented as in the diagram (Fig. 12); the stimulus is dissipated in the formation of ideas connected with the suggestion, and it is, therefore, the conscious function of the neuronic group which acts in response to the stimulus. In the case of the suggestion made to the hypnotised subject, there is no ideation; the subject does not consider

the possible truth or untruth of the suggestion; its reasonableness, or the reverse; for those functions are inhibited. Those paths being thus shut off, the stimulus must be dissipated in the other functions of the neuronic group, and these are the physical.

Yet the inhibition of the conscious process is not complete; for obviously before the motor effect can be produced the meaning of the suggestion must be

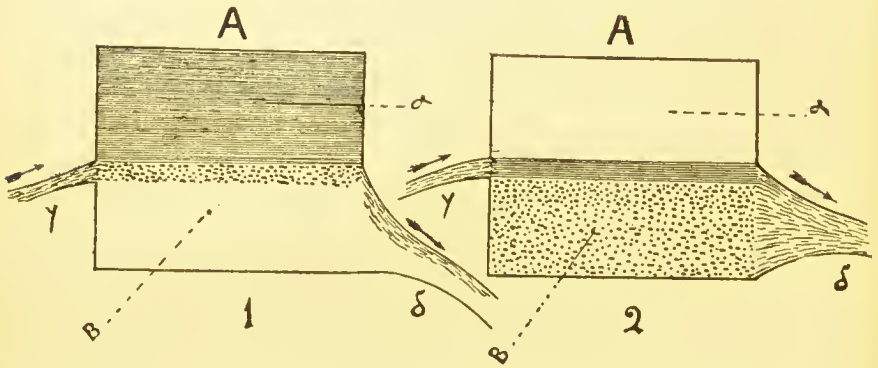

FIG. 12.—*Diagram to illustrate the distribution of a physical suggestion* (1) *to a person in the normal condition* (2) *to a person in hypnosis. A. The neuronic group,* (α) *the conscious functions,* (β) *the unconscious functions,* (γ) *the stimulus,* (δ) *the motor impulse. The parts shaded indicate the parts in action; lined shading, conscious; dotted shading, unconscious.*

appreciated; but this is an attendant process, unassociated with the development of ideation. In the same way the inhibition, in the normal state, of the motor functions is not complete; for associated with the consciousness and ideation caused by the sug-

gestion, is the motor part of the emotion of surprise, etc., with which the suggestion was received.

The principles here enunciated enable us to gain a more thorough appreciation of the processes employed in the execution of suggestions which are psychical in their nature. It may appear difficult to apply our theory to these conditions, which are especially characterised by the action of the higher groups, such as those employed in hallucinations, illusions, etc. (p. 131); especially may this appear to be the case when we have to do with increased sensory powers (p. 148). But when we realise the limitations which surround the exhibition of these phenomena, we shall find that they present no difficulty, and that in many points they lend a striking confirmation to the views here expressed.

One of the most noteworthy features in a post-hypnotic hallucination is the completeness with which it possesses the individual. If we take an ordinary uneducated boy, and suggest to him that when he wakes up he will find himself a certain eminent actor, we notice that he takes to the part with a readiness which appears astonishing. Not that his powers of elocution or acting are, in themselves, increased; but all the influences which would restrain him were he "acting" are absent. There is no self-consciousness; no consideration as to whether he is interesting his audience; all his ideas are turned in the direction of the idea which has been

suggested to him. Moreover, it is not concerned with any volitional energy on his part; he would be amazed at the person who told him he was *not* the actor in question. He would be in the same frame of mind as we should be were we told that we were not ourselves. The reason of his condition is as follows. We have already explained that in the appreciation of the suggestion the consciousness of the hypnotic subject is not interfered with, so that we have a full and free play of the subject's ideation and emotion with reference to the suggestion which is their stimulus; but there is still, not only in theory, but, as we have seen, in fact, a marked limitation to the action of his consciousness with reference to the suggestion in directions other than that indicated by the suggestion. Coincident with the inhibition of one set of functions, there is an increased capability of action in the others; the result we may represent almost mathematically. The stimulus, instead of being dissipated amongst an indefinite number of neuronic groups, or parts of groups, is confined to those whose function is the pure appreciation of the stimulus; the other groups whose function is the consideration of the reasonableness of the suggestion and the development of the stimulus in other conscious directions are inhibited. Let us represent the stimulus by 5; in the hypnotic state, the 5 is confined to, and therefore being dissipated in, one department of conscious activity. In the normal

state the 5 is dissipated in various directions, and assuming that there are at least twice as many neuronic groups in conscious action as there are in hypnosis, we may safely divide the 5 by 2 to represent the share of any one function; but, further, the other $2\frac{1}{2}$ would be dissipated not in assisting the execution of the suggestion, but in its consideration, and, consequently, in the retardation and prevention of any execution. Hence, taking this as an example, in hypnosis we have a force represented by 5 acting unrestrained; in normal conditions, with the same stimulus, there is a force of $2\frac{1}{2}$ opposed by a force of $2\frac{1}{2}$.

Many problems of great interest are suggested by the careful examination of the phenomena of hallucinations and illusions belonging to the deeper states; moreover, the probability that the function of memory essentially belongs to the neuronic group connected with the action, and the reasons for this unity of function are clearly brought out in many experiments; but we do not propose to deal at length with the phenomena of hallucination, for while their etiology differs in no wise from the other premises of hypnosis, many other considerations would have to be brought forward which would involve us in a psychological discussion impossible to keep within our limits. But some of the questions may be briefly illustrated. In the experiments where an educated subject was led to spell incorrectly (*vide* p. 120), there was distinct evidence of a

conflict between the suggested ignorance of the subject and his actual knowledge. The action of the neuronic group under these suggestions presents some curious problems. Did the subject, for instance, think at the time that "hundrud" was the correct spelling; or did he write it so because he was suggestively conscious that "hundred" was wrong? It was noticeable that before omitting the letter "a" or committing an error of spelling, there was a momentary but distinct hesitation. The spelling in the specimen reproduced is nearly, though not quite, phonetic, and it is difficult to say whether the suggestion simply had the effect of causing the subject to spell phonetically or whether a more elaborate process was induced. The latter hypothesis appears to be the more probable, and in all cases it would seem that there is a distinct knowledge in the subject's mind of the right form, which, however, is so suddenly and automatically modified, by the action of the suggestion, that he is never conscious of the modification. This kind of ignorance is present to some extent in the normal state; we are not actively conscious of the separate effects produced by the rays from any object striking the eye; we are only aware of the final result, *i.e.*, we see the object.

There is a moment in all hypnotic illusions when, though the subject knows it not, the brain recognises the truth. If we suggest to a subject that when he sees the letter "a" he shall think it is

"b," it is obvious that he must perceive and recognise "a" before he can confuse it with "b." The complexity of the process instituted by any suggestion of this kind is evident when we consider that not only does the apparatus of vision act in the normal manner, but the perception must first act normally before the suggestion can take effect, and when the suggestion has taken effect, the impression remains a psychical one and does not affect the retina of the optic nerve (*vide* note, p. 151).

It is clear, from the final result of the suggestion, that the psychical impression at once interprets the stimulus of objective reality, according to the original cerebral stimulus supplied by the suggestion. There is present, that is to say, as a result, a condition of the cerebral cells which will accurately adapt the action to the combined effect of the suggestion and the objective stimulus. This was well illustrated in the following experiment:— It was suggested to a subject in hypnosis that at a certain time (about a week later) and at a certain place, he should find that T—— was V—— and that V—— was T——. During the interval there was no confusion in his mind as to their respective personalities; but, at the time and place suggested, coming up to V——, he asked him if he knew where V—— was, and, on seeing T—— just entering the hall, went towards him saying, "Ah, there he is." For the next hour, which was the limit given in the suggestion, it was impossible to

disabuse him of the idea; at the expiration of the hour he looked somewhat absorbed in himself and puzzled for a few moments, and then continued his conversation; only, he no longer confused the two persons, and, when challenged with what he had previously been doing, he stoutly denied that he had done anything of the kind. Another experiment of a similar nature may be mentioned. L—— and M—— are intimate friends. It was suggested, in hypnosis, to L—— that M—— was V—— and that V—— was M——. This suggestion was made at 11.30 a.m. and continued entirely effective until 2.30 p.m., when L—— was hypnotised again and the impression was removed. The three went for a walk, lunched together, played billiards, etc., L—— confusing M—— and V—— the whole time. In this case L—— remembered afterwards all that had occurred, but still retained the impression that what M—— had done was V——'s doing, and *vice versâ*. Thus, V—— played billiards with him whilst M—— marked; but he said (after the removal of the suggestion) that it was M—— who played with him and that it was V—— who marked, and so forth. These two cases are examples of two distinct post-hypnotic states (*vide* p. 127); in neither case was the subject open to further suggestion. The action of the memoric faculty, in its twofold aspect of the preservation and the reproduction of ideas, is vividly illustrated by some of the phenomena of hypnosis. The

observed facts seem to support the view that no impression is ever absolutely effaced from the brain; the faculty of recalling an idea (recollection) may be absent, but the cerebral record is permanent. The two cases quoted on p. 110 seem to be hardly capable of explanation on any other hypothesis. The phenomena of memory as seen in the dreaming, sleep-walking, and hypnotic states all point to this conclusion. The faculty of recalling these impressions is, however, generally non-existent when the brain is in a different condition from that in which the impression was made. The recollection of an idea depends upon the ability of the brain to link together its various impressions until it gains a connected whole, of which the part recollected is an essential feature. If, then, by some cerebral modification there be a distinct break in the chain no recollection will be possible. Accordingly there must be some connection between that recollected and the moment of recollection; the link may be supplied in many ways, but if the physiological modification be great so will the difficulty of recollection be correspondingly great. If, therefore, there be a profound physiological change, such as occurs in hypnosis, the probability is that recollection will not be present until that physiological condition is reproduced. This law is adequately illustrated by the phenomena of hypnosis, to which we have referred in the previous chapter.

Moreover, our general knowledge of the memory is brought to a more definite state by considerations resulting from our knowledge of the condition underlying the relations between the physical and psychical action of the nervous system; we may assume that each neuronic group possesses the memory of the stimuli which it has received, and that there is a necessary sensation-memory and motor-memory intimately associated with the recognition of stimuli and with the discharge of the proper motor impulses.

We have attempted in this rapid introduction to the subject of the physiology of hypnosis to place before the student an argument as to its etiology and its relationships with the normal conditions derived almost entirely from observation and experiment. That in so complex a subject we should have adequately considered each phenomenon of importance is not possible, but we have endeavoured to select various examples typical of their kinds and thus illustrate the general principles underlying the nervous adaptation in hypnosis. No doubt we may still be told that the mental processes, and especially those occurring in hypnosis, are so many puzzles interesting though never soluble; but to the student properly acquainted with his subject there is no mystery in hypnosis. Our knowledge is far from complete, but it is only when there is a great deal known about a subject that the incompleteness of our

knowledge becomes evident. In hypnosis itself there is nothing mysterious or insoluble; the uncertain elements in it belong to it in common with all those processes connected with the immaterial and imponderable reaction to stimuli. At least we may comprehend the fact that thought is ultimately as much a physical fact as the process of secretion in a gland or the beating of the heart, and that these functions are necessarily associated with one another, not by reason of any impression from the "Mind," but in an exact quantitative relationship. Given the definite stimulus, it may result in high psychical activities and give rise to a thought; with the conscious function debarred from action the stimulus is expressed in other than conscious terms; it is in hypnosis that we can regulate the course of the stimulus and determine its reaction.

CHAPTER V

VARIETIES OF NERVOUS ACTION

The human mind and the logical faculty—The emotional faculty —The influence of environment—The opposite influence—The necessity of predisposition—The harmony of the reason and emotion—The basis of reason—Unity of impressions—Mental influence on the animal functions—The condition of sleep— The Dacoits—Coma—Examples of sleep allied to coma—The dreaming state—Conditions for the induction of sleep—The receptivity of the sleeping state—The nature of the dreaming state—Somnambulism—Views of Liébeault, Bernheim, Moll, and Tuckey on sleep—The analogies of the waking state— Müller—Herbert Spencer—Ideas and sensorial impressions— Examples of these—Ideation—The origination by nerve centres —Suspension of the inhibitory centre—Suggestion—Different forms of this—Automatic and voluntary actions—Increased power due to combined action of these—The intellect and sensations — Braid's experiments—Other illustrations — Dr Wigan—Herbert Spencer—John Hunter—Involuntary actions —The intellect and the organic functions—Hysteria—Religious convulsions—The Fakirs—The Aïssouans—Ochorowicz.

THE laws governing nervous action, which we have endeavoured to elucidate in dealing with the physiology of hypnosis, may be studied in a variety of conditions other than that of hypnosis, and whilst the hypnotic state provides us with the best means of demonstrating the various reactions of the nervous system to stimuli, since we are able to

alter the conditions of the experiment at will, yet many more or less abnormal conditions of the nervous system provide us in one way or another with examples of the results following a change of balance in the relative activity of the various neuronic groups. Regarded in this light they are the more interesting, as in many cases the altered balance is part of a normal process of more or less spontaneous origin within the cerebrum. Leaving out of consideration the technical treatment of suggestion, we may turn our attention to the mental processes in their normal and slightly abnormal everyday aspects. Our methods here cannot be experimental, nor can they be so definite, yet much may be learnt by a tentative comparison of these conditions. Here, then, we should distinguish the methods by which the brain trains itself. For the logical faculty of the brain is chiefly the result of training and education, and this logical faculty, even in the spheres where it should be most used, is always modified by the senses of emotion and affection; whilst, in the predisposition towards certain modes of thought and action, heredity plays an important part. The exercise of discrimination in the acceptance of statement and dogma comes to us as we recognise the necessity of such scepticism. During childhood this faculty does not exist, and statement and dogma are impressed on the infant mind without arousing any logical resistance; nor does the child possess any reasoning consciousness

of possible error. The education of the child, unless it be peculiarly and exceptionally wise, tends to restrain the action of free-will, and it may be doubted whether any mind is capable of altogether withdrawing itself from the bonds of training, circumstance, and environment, to which during its infancy it has been subjected. For the mind of great reflective and analytical power is apt to resent all ideas which appear to have been impressed on it by such means, and is, in consequence, attracted by views and theories of an opposite nature. Thus, in the latter case, there is a prejudice against belief, and, in the former, there is a wish to believe; both impulses springing, not from an inherent power in the mind, but from an external impression.

Nor do men base their reasonable acts on any logical process; the object of the public speaker, of the religious preacher, of anyone who tries, with any success, to bring the majority round to his side, is not to put before his hearers or readers a course of philosophic thought in which no flaw is to be found, but, rather, to touch some common chord, and elicit for his doctrines a sympathetic predisposition and attention. Given this, his views do not meet with the calculating, fault-finding criticism of the cold opponent, but are received by minds already prepared to explain away difficulties and invent further theories of their own to account for any apparent inconsistency or want of harmony;

so that in reality our question with reference to a statement is not, is it true ? but, does it coincide with our previous impressions ?

Thus logic provides excuses and smooths the way for, but does not primarily induce, the acceptance or rejection of any dogma.

Nevertheless, the very use of the logical faculty to justify a course of action, primarily instituted by the emotion, is an evidence of the importance given to reason ; and, as the critical side of the mind is more cultivated, so will the emotional become more modified, the result being an intellectual harmony hard to realise and incapable of analysis.

Still, however subdued or modified this emotional part of the brain may be, it is never altogether absent, and indeed, if not in all, at least in the majority, it may be said to predominate. The real and proper use of the logical faculty is plainly the pursuit of knowledge—a pursuit dictated by the love of truth. Thus not only is the belief or the disbelief of any proposition an act in which the logical and the emotional are combined, but the cause of such intellectual action is purely emotional. That these statements may seem rash and paradoxical is more than probable ; yet it is only possible to avoid these conclusions if we are able to show that there are any whose acts and thoughts, in their origin and execution, are purely logical. We have, therefore, a mental state to consider which, in its normal condition, is the result of an

elaborate balancing of ideas, sentiments, theories, and facts; neither the reason nor the emotion is capable of acting entirely independently of the other, they perform their functions in such subtle harmony that no single act can be described as purely reasonable, emotional, or ideational. It follows, then, that an impression made on the emotion by no means remains merely an emotional impression, but will lead the reasoning faculty to adapt the actions it dictates, to a harmony with the emotions aroused; an impression is not confined to the particular group which is primarily affected, but extends its influence over the whole brain. As we study the phenomena of what is termed suggestion, we see the importance of clearly appreciating this complex action of the brain, in virtue of which an impression received by a single sense is converted, by the persistent tendency of the brain to harmonise all its perceptions and emotions, into an impression received and endorsed by the whole of the reasoning and perceptive faculties.

Thus far we have only touched on the psychological aspect of this mental action; we have still to note that, if the brain be the organ of the mind, it is equally the organ of the animal functions. To its initiative is due every act of the body, and here the harmony of the human organism is more apparent. Illness of the body will result in illness of the mind. We have only to stay in a

town where the climate is enervating to find that a corresponding lassitude of mind accompanies the enfeebling of the animal functions. We feel ill and go to the theatre or spend some time amidst a brilliant society, and forget, in the excitement and pleasure of the moment, our ills and pains, to find, when we cease from the enjoyment, that we no longer feel ill and depressed but well and happy. The degree of influence which is exerted over the body by the mind necessarily varies largely; in the person of dull, heavy, and stupid disposition its results are by no means striking; to the brilliant, vivacious disposition, where the mental instrument is of fine adjustment and delicate structure, we look for our best examples; whilst we learn much from the study of those abnormal cases, where the brain is over sensitive and more or less out of balance, and where, in consequence, results are obtained of a more striking character. From the results of a pathological condition we may learn something of the physiology of the normal. We may then consider the various states of the brain in some of the many aspects it presents under normal and under exceptional conditions.

Profound sleep is a suspension of the animal powers of sense and motion. In this state the consciousness is not excited by the transmission of sensation to the brain, nor by the transmission from the brain of nervous impulses. During the deepest sleep the animal processes proceed uninterruptedly.

Pulsation, respiration, continue; while the unconsciousness of the sleeper remains apparently perfect he is capable of adapting himself to outside circumstances; thus, he will turn in his bed from weariness of the same posture; will rub a limb or any part of his body in order to allay irritation. Carpenter quotes a case showing the possible adaptation of actions to a definite purpose. "It is said that the Dacoits or professional thieves of India have been known to steal a mattress from beneath a sleeper by taking advantage of this tendency. They begin by intensifying his sleep, by gently fanning his face, and then, when they judge him to be in a state of profound insensibility, they gently tickle whatever part of his body may lie most conveniently for their purpose. The sleeper withdrawing himself from this irritation towards the edge of the mattress, the thief again fans his face for a while, and repeats the tickling, which causes a further movement. And at last the sleeper edges himself off the mattress, with which the thief makes away."

Profound sleep is to be distinguished from *coma* by the fact that, in the one case, it can be ended by strong sense-impressions, whilst, in the other, the sleeper cannot be aroused; but there are transitional stages between the two. Sleep may partake of the nature of *coma*. During the heat of the battle of the Nile some of the powder boys fell asleep upon the deck; and during the attack upon Rangoon, in the early Burmese war, the captain of

one of the steam frigates most actively engaged, worn out by the continued mental tension, fell asleep, and remained perfectly unconscious for two hours, within a yard of one of his largest guns, which was being worked energetically during the whole period.

Between the condition of normal profound sleep and the normal waking state, there are many gradations.

The *dreaming* state seems to be one in which the sensory function of the neuronic groups is primarily though not always completely interfered with, but the inhibition of the higher intellectual functions has been more or less completely withdrawn; the motor functions are, however, still inhibited.

For the induction of sleep several concomitant conditions are necessary, the chief of which appear to be an exhaustion of potential energy in the brain cells, caused by previous functional activity; a less and decreasing flow of blood through the brain; chemical changes in the tissue and brain due to the waste products caused by nervous action. Other conditions are more or less necessary, such as a comfortable posture, a peaceful state of the mind, the absence of external excitement, etc. Sometimes, however, the presence of external excitement is necessary; those accustomed to sleep in the midst of great noise find it difficult to sleep when there is perfect silence. Monotonous repetitions have a tendency to induce sleep; the unvarying accents of

an unskilful lecturer are an instance. The transition from the waking to the sleeping state, and *vice versâ*, may be sudden; but generally there is a noticeable gradation. Thus, the man who, when sitting in his arm-chair, "dozes," is brought back to a partial degree of consciousness by his head falling forward. It is a common experience with many to wake up at any time they may have previously decided upon. It is possible to awake a heavy sleeper by means which would fail entirely with another—the means being incident to his calling or profession. Carpenter gives a graphic illustration of this:—"Most sleepers are awoke by the sound of *their own names* uttered in a low tone, when it requires a much louder sound of a different description to produce any manifestation of consciousness. The same thing is seen in comatose states; a patient being often found capable of being momentarily aroused by shouting his name into his ear, when no other sound produces the least effect. The medical practitioner, in his first profound sleep after a laborious day, is awakened by the first stroke of the clapper of his night-bell, or even by the movement of the bell-wire which precedes it. The telegraph clerk, however deep the repose in which he has lost the remembrance of his previous vigils, is recalled to activity by the faintest sound produced by the vibration of the signalling needle."

Thus, in ordinary sleep, there is often present a

peculiar *receptivity* for certain definite sense-impressions acquired by reason of the previous direction of the mind.

Dreaming sleep presents many noteworthy peculiarities. The consciousness of the external is completely absent; the mind is more or less active; consciousness of this action is more or less present, and the subsequent remembrance of the dream is sometimes complete, sometimes hazy, and sometimes non-existent. All control over the current of thought is suspended. There are many instances where the sleeper in his dream has been able to complete calculations, write poems, compose music. Many have solved problems in the dreaming state, and have remembered sufficient of the train of thought, on waking, to be able to put the solutions down on paper. These, however, are exceptional; and by far the most common dream is that in which the thoughts run on, from one circumstance to another, in an incongruous and ridiculous maze. In the dream the ridiculously impossible chain of events excites neither wonder nor surprise. There is no operator to suggest a train of thought or an idea, and the active part of the brain seizes on the thoughts and events that engaged its attention during the waking state; if a hypnotist could by delicate and skilful suggestion, provided the sleep were not too deep, establish *rapport* between the sleeper and himself, there seems great probability that the sleeper might in some cases be as sus-

ceptible to suggestion as any hypnotised subject. It is said that this experiment has been tried with success, and if this *rapport* could be clearly established in even a few cases, the demonstration of the essentially physiological characters of hypnosis would be complete. The exact point, however, is very difficult to hit upon. If the person be sleeping lightly the speech necessary in making the experiment would be likely to wake him; or, on the other hand, he would be insensible to any suggestion by reason of his deep sleep. In the few experiments of this nature that the writer has been able to make, he has met with some satisfactory but not conclusive results.

The various hypnotic states seem in some degree to find their counterparts in dreaming sleep. There seem to be in fact three phases of dreams—dreams, occurring most frequently in deep sleep, which, in the waking state, are quite forgotten; dreams remembered on waking; dreams in which the sleep is so light that they are not only remembered, but their unreality is recognised during the dream itself.

For all these curious facts, we find striking analogies in the various degrees of hypnosis. There is a more intense form of dream—sleep-walking, or somnambulism—which differs from the lighter forms in the fact that the dreamer not only thinks but acts. The sensory functions are still interfered with, but inhibition has been withdrawn in these cases from

both the intellectual and the motor functions of the neuronic groups affected. Here again there are many stages, from that of the one who mutters incoherent words to the deepest somnambulism. The somnambulist can clearly see his way as he passes by, but he does not see any persons who may be watching him; nor does he hear words that are addressed to him. He is awake, apparently, only to perform the particular act which is in his mind. It is possible, however, for the somnambulist to hear words addressed to him if they have reference to the subject on which he is intent. The following, quoted from Carpenter, is a case in point:—"A young lady, when at school, frequently began to talk after having been asleep an hour or two; her ideas almost always ran upon the events of the previous day; and, if encouraged by leading questions addressed to her, she would give a very distinct and coherent account of them, frequently disclosing her own peccadilloes and those of her schoolfellows, and expressing great penitence for the former, whilst she seemed to hesitate about making known the latter. To all ordinary sounds, however, she seemed perfectly insensible. A loud noise would awake her, but was never perceived in the sleep-talking state; and if the interlocutor addressed to her any questions or observations that did not fall in with her train of thought, they were completely disregarded. By a little adroitness, however, she might be led to talk upon almost any

subject—a transition being *gradually* made from one to another by means of leading questions."

Perhaps the most important note of the somnambulic state is that nothing of the thought or action is remembered in the waking state, or is remembered only as a dream. Every particular, however, is often remembered on the next occasion. Another case is quoted, by Carpenter, proving clearly this fact. "A servant-maid, rather given to sleep-walking, missed one of her combs; and being unable to discover it, on making the most diligent search, charged the fellow-servant, who slept in her room, with having taken it. One morning, however, she awoke *with the comb in her hand*; so that there can be no doubt that she had put it away on a previous night, without preserving any waking remembrance of the occurrence; and that she had recovered it when the remembrance of its hiding-place was brought to her by the recurrence of the state in which it had been secreted." This recurrence of memory coincides precisely with the features of the hypnotic state, where the subject on awaking will know nothing of the experiments performed, but on the next hypnosis will remember them all. Finally, we may quote one of the most complete cases extant, recorded by Abercrombie on the authority of James Gregory. An officer who served in the expedition to Louisburgh in 1758 was subject to dreaming. The course of this individual's dreams could be completely directed by

whispering into his ear, especially if this was done by a friend with whose voice he was familiar, and his companions in the transport were in the constant habit of amusing themselves at his expense. At one time they conducted him through the whole progress of a quarrel, which ended in a duel; and when the parties were supposed to be met, a pistol was put into his hand, which he fired, and was awakened by the report. On another occasion they found him asleep on the top of a locker in the cabin, when they made him believe he had fallen overboard, and exhorted him to save himself by swimming. He immediately imitated all the motions of swimming. They then told him that a shark was pursuing him, and entreated him to dive for his life. He instantly did so, with such force as to throw himself entirely from the locker upon the cabin floor, by which he was much bruised, and of course awakened. After the landing of the army at Louisburgh, his friends found him one day asleep in his tent, and evidently much annoyed by the cannonading. They then made him believe that he was engaged, when he expressed great fear, and showed an evident disposition to run away. Against this they remonstrated, but at the same time increased his fears, by imitating the groans of the wounded and dying; and when he asked, as he often did, who was down, they named his particular friends. At last they told him that the man next to himself in the line had fallen, when he instantly

sprang from his bed, and was aroused from his danger and his dream together by falling over the tent ropes. After these experiments he had no distinct recollection of his dreams, but only a confused feeling of oppression and fatigue, and he used to tell his friends that he was sure they had been playing some trick upon him. Liébeault and Bernheim have all along maintained the close relationship of natural and hypnotic sleep. Moll and Lloyd Tuckey, however, though they both adopt the methods and theories of Nancy, differ from this opinion. Tuckey says, "I cannot but think that Bernheim has somewhat exaggerated the closeness of the analogy between hypnotic and natural sleep," and unquestionably in the lighter forms of hypnosis the resemblance is not, at first sight, great; but the fact of the subject's expectancy and of the artificial induction of the state may serve to explain the increased powers of that state compared with light natural sleep; hypnosis, however, always presents phenomena differentiating it from sleep.

The influence of the "mind" upon the "body" to those who have studied at all the nervous system, seems no more wonderful than the influence which the body has over the mental state; but the sudden physical changes which occur in response to a mental impression, often occasion surprise from the fact that the cause is a power so intangible and so little understood as the mental processes. The nature and power of this influence vary greatly in individ-

uals, but its universal presence is demonstrated. Müller said that "Ideas do not act merely on the motor apparatus by which they are expressed; they as frequently affect the organs of sense, which then present sensorial impressions or images of the ideas." Herbert Spencer, by his own account, experienced the same thrill if he thought of seeing a slate rubbed by a sponge that actually seeing it produces. The well-known tale of the butcher who, when getting down a joint of meat, fell and was caught up by the hook, is another instance. The hook, as a matter of fact, only passed through his coat; but he imagined that he was literally hung up by the flesh, and experienced in consequence, the most acute agony. Hack Tuke relates a curious illustration of the influence of the imagination upon sensorial impression, which occured during the fire at the Crystal Palace in 1867. When the animals were destroyed by the fire, it was supposed that the chimpanzee had succeeded in escaping from his cage. Attracted to the roof with this expectation in full force, men saw the unhappy animal holding on to it, and writhing in agony to get astride one of the iron ribs. It need not be said that its struggles were watched by those below with breathless suspense and "sickening dread." But there was no animal whatever there, and all this feeling was thrown away upon a tattered piece of blind, so torn as to resemble to the eye of fancy the body, arms, and legs of an ape! Tuckey quotes a case recorded

by Woodhouse Braine. The anæsthetist had placed the inhaling bag, without any ether or other anæsthetic, over the mouth and nose of the patient—a young girl—in order to familiarise her with the treatment. He was astonished to find that in a moment or two the patient was becoming unconscious; and, soon, her eyes turned up and she was perfectly insensible, and a painful operation was performed without the use of any anæsthetic. "Imagination" is a proper term to use in such cases, if it be properly understood; but it must be remembered that the effect is as real and just as much a fact as if the effect had been produced by the ordinary means; and that the effect of "imagination" is not imaginary.

This is conclusively shown in the instances quoted, and, however wonderful or inexplicable it may seem to many, it cannot be denied that the imagination was sufficient to produce a state in which a most painful operation could be performed without in the least distressing the patient. But, in reality, the phenomenon is no more inexplicable than the ordinary and more normal action of the nerves, and for this reason we may prefer the term "Ideation" to that of "Imagination," since the latter word, by its frequent use, in many different senses, is easily capable of misconstruction, and is likely, therefore, to be misleading. *Ideation* is the name given to a certain function by virtue of whose activity the stimuli received by the brain are

brought into connection with and developed in harmony with the reactions of previous stimuli.

It is well known that under circumstances of extreme fright acts have been performed which, under ordinary conditions, would never have been attempted. Men chased by bulls have jumped across streams, cleared hurdles, and accomplished athletic feats which, in their every-day life, they would have laughed at the idea of trying. Tuckey records the case of a young lady who had for months been confined to her bed, or couch, unable to walk a step, from apparent paralysis which defied all treatment. One morning news was brought that her brother, to whom she was devotedly attached, had fallen from his horse and was lying in a critical condition some miles away. She immediately got up, herself helped to saddle a horse, rode to the scene of the accident, and nursed her brother night and day for a week. The nervous shock had brought the will into operation, and she was permanently cured.

Many more instances might be adduced, but those quoted are sufficient to illustrate the influence of suggestion on the nervous, and consequently on the physical, system. It may be said, however, that the practice of suggestion in the case of weak-minded persons is no doubt of value, but that it is unlikely to be applicable to one possessed of a really healthy mind and body. In reality, every one is influenced by suggestion; in the case

of one with no great strength of will, a word or an act may be sufficient to attain the purpose, whilst a healthy mind will generally only respond to a more hidden and a more subtle impulse. What is it that so imbues the mind of the Conservative with his principles, that he completely fails to appreciate the qualities and doctrines of his opponents ? And why such contempt in the Liberal for the ideas of Conservatism ?

Training, education, environment, in the large majority of cases, account for the political and other views of men. All these are but forms of suggestion, emphasised, possibly, at no given time with any great insistence, but, year by year, engrafted on the mind.

The influence which a learned and patient scholar will exert over many of his listeners and readers is of a similar nature. The most successful leaders of thought are those who best know how to " suggest " by a subtle combination of the tentative and the dogmatic.

Thus, there seems to be in the human organism a dual nervous action, the one " automatic " and intuitive, the other rational, volitional, and deliberative.[1] They may act separately, or together, as circumstances demand. Generally, walking, seeing, hearing are automatic actions in which no exercise of the will is necessary ; nor can it be said that, though the action of the will is not felt, it may,

1 *Vide* Tuckey, op. cit.

nevertheless, be necessary to, and acting in, these "automatic" acts. Such an hypothesis is not applicable to the involuntary movements of the hand or arm, often made on the impulse of the moment, to be checked the next moment by the action of the reasoning and deliberative centres; and it is not possible to allow of any volitional act in the performance of the organic function of respiration. Whilst the action of these two parts of the nervous system—the automatic and the rational—is frequently distinct, it is almost equally common for the two to be working in harmony, leading thereby to increased functional power.

By the concentration of the attention and the will, a small or distant object can be discerned, which otherwise would be indistinct; and similarly, sound may be heard by concentration or expectant attention, which would otherwise escape the ear. Many, when working at some difficult problem, are accustomed to close their eyes for several moments, and this instinctive action leads to greater power in the other centres.

It is well known that the constant use of any one sense by such concentration will lead to increased automatic function of that sense. The extraordinary extent to which these powers may be increased in abnormal conditions of the waking state is exemplified by the fine senses of touch and hearing developed in the blind. An interesting case of increased faculties in such an one has been com-

municated to the writer by a lady. The blind man is an adept organist; by the difference of sound, which his footstep makes, he can tell when he is approaching a tree or a lamp-post, and can distinguish between them. In the same way he will distinguish between a house, a wall, or railings. By the sound of his voice he knows whether the door of a room be open or shut. The senses of touch and smell are developed to a similar extent, till it would seem that he could hardly do more had he the use of his sight.

Intellectual affections are capable of producing sensation—increasing the sensation to an abnormal degree, or suspending it altogether. Instances of the production, increase, or suspension of sensation are to be found in large numbers. All three may occur in the same individual at different times, but the individual is more often found to be subject to only one of these intellectual influences.

Braid records an experiment bearing on this point. He requested four gentlemen in good health to lay their arms on a table with the palm of the hand upwards. Each was to look at his palm for a few minutes with fixed attention, and watch the result. In about five minutes the first, a member of the Royal Academy, stated that he felt a sensation of great cold in the hand; another, who was an author of note, said that for some time he thought nothing was going to happen, but at last he experienced a darting, pricking sensation in the palm

of the hand, as if electric sparks were being drawn from it; the third gentleman, who had been mayor of a large borough, said that he felt a very uncomfortable sensation of heat come over his hand; the fourth, secretary to an important association, had become rigidly cataleptic, his arm being firmly fixed to the table.

The noticeable point about this experiment is that Braid made no suggestion that there should be any sensation, and in trying experiments of this kind the writer has frequently sought to find some connection between the intellectual disposition of the individual and the nature of the sensation experienced. In young women of good mental capacity and of sensitive disposition, the arm will most frequently become cataleptic; in men and women of brilliant capacity, the arm generally becomes rigid, or they feel a sensation often described as "pricking," but more often as "very strange"; whilst in those of somewhat lower mental order, but of a more even temperament, heat or cold is most commonly felt. The explanation seems to lie in the fact that the blood supply of a part will be increased if attention is devoted to that part.

John Hunter said, "I am confident that I can fix my attention to any part until I have a sensation in that part." The fact of this increased flow of the blood does not, however, explain the varying nature of the sensations, nor the catalepsy, and it is probable that the sense of constriction, due to the

exeess of blood, aets as a suggestion *per se* in persons of " cleetric " or sensitive nature, resulting in partial or eomplete inhibition of the motor impulses. This seems the only possible explanation of the eatalepsy; but there are other explanations applieable to the simple sensation. The eonstant ehanges whieh take plaee in the tissues are unobserved by the individual in normal circumstanees; but it is not impossible that on the attention being direeted to a partieular part, those proeesses may, to a eertain extent, affeet the eonseiousness, and thus form an inherent suggestion. Reiehenbaeh imagined he had diseovered a new power whieh he termed the " Odic " foree. This power he found to proceed from magnets, and he elaborated his theories with mueh eloquence. Braid investigated these diseoveries, and found that, drawing a magnet or other objeet from the wrist to the point of the fingers produeed nearly always some effeet. The persons would experience a ehange of temperature, tingling, ereeping, prieking, etc., whilst when he drew the magnet from the fingers to the wrist, it was generally followed by a ehange of sensation from the altered eurrent of ideas suggested by the reversed motion. In order to satisfy himself that these were all due entirely to suggestion, Braid requested his patients to look aside, or interposed a sereen, and if they were requested to deseribe their sensations during the repetition of the processes, similar symptoms were realised when there was

nothing done beyond watching them and noting their responses. Braid quotes another case. The patient was a lady, whom he placed in a dark room, he then requested her to look at the poles of a powerful horse-shoe magnet, and to describe what she saw. After some time she declared that she saw nothing. He then told her to look attentively and she would see fire come out of it. She soon saw sparks, and after a little time, in great numbers. The trunk which contained the magnet was then closed, but she still saw the sparks. Making the suggestion to her, by leading questions, Braid asked her to describe what she saw from another part of the room, where there was nothing but bare walls, when she described the most brilliant coruscations.

Wigan records a striking instance which occurred within his own experience. He was attending a soirée given in Paris by M. Bellart, shortly after the execution of Marshal Ney, which had created a profound impression at the time. On the arrival of a visitor, M. Maréchal *aîné*, he was announced as Maréchal Ney. Wigan said that an electric shudder ran through the company, and the resemblance of the prince was, for a moment, as perfect to his eyes as if it had been the reality. With reference to this instance, as a confirmation of the fact that whilst due to the imagination, the illusion is not in the ordinary sense imaginative, Herbert Spencer may be quoted:—"Those vivid states of consciousness which we know as sensa-

tions, aeeompany direet, and therefore strong, exeitations of nerve eentres ; while the faint states of eonsciousness whieh we know as remembered sensations, or ideas of sensations, aeeompany indireet, and therefore weak, exeitation of the same nerve-eentres." John Hunter said that "every part of the body sympathises with the mind, for whatever affects the mind, the body is affeeted in proportion."

Every human passion is betrayed in aetion when, apparently, such aetion is quite unneeessary. At a public meeting, where keen interest is aroused, the various emotions are depicted on the faces of the audienee. The movements made in private eonversation, often quite involuntary, and always in harmony with the thoughts and utteranees of the speaker, betray to an extent frequently unappreeiated, the subtle inner-action of the various neuronie groups. Not only does the intelleet possess and use an enormous influenee over the sensations and voluntary actions, but the organie functions are equally affeeted by it. One of the most curious instances reeorded is that of a medical student in Paris, who was being initiated into the mystie rites of a Masonic soeiety. His eyes were bandaged, a ligature bound round his arm, and the usual preparations made to bleed him. When a pretence of opening the vein was made, a stream of water was spurted into a bowl, the sound of which resembled that of the flow of blood which the

student was anticipating. The consequence was that in a few moments he became pale, and before long fainted away. Perhaps the strongest and most patent testimony of the Influence of the "Mind" on the "Body" is to be found in hysterical cases.

An hysterical patient[1] will suddenly take to her bed and declare she has no feeling and no power in her arms or legs. The most careful examination shows that she is speaking the truth. Pins may be thrust into the limb, it may be punctured or scorched, and yet the patient neither winces nor betrays the least sign of pain. Analogies of such a state are to be found in ordinary life; when, by excitement or some disturbing influence, the brain is working at such a high strain as to be beyond its inhibitory and volitional control. Soldiers engaged in a furious battle have been seriously wounded and have fought on, unconscious of either pain or injury, and, still more frequently, in the midst of a game an injury has been received, of which the player is conscious, but, till his excitement has cooled down, he has not had the power to locate the injury. The extraordinary treatment to which hysterical persons can be subjected without experiencing any ill effects, is remarkable. Montgeron[2] relates that many women who visited the tomb of the Abbé Paris gave themselves blows with instruments in

[1] This and other cases are taken from "Spiritualism and Nervous Derangement." Hammond.

[2] La Vérité des Miracles, quoted by Hammond, op. cit.

such a manner that the sharp points were forced into the flesh. Fouillon[1] states that another had herself hung up by the heels with the head downwards, and remained in that position three-quarters of an hour. One day, as she lay extended on her bed, two men who held a cloth under her back, raised her up and threw her forward two thousand four hundred times, while two other persons placed in front, thrust her back. Another day, four men, having taken hold of her by the extremities, began to pull her, each with all his strength, and she was thus dragged in different directions for the space of some minutes. She caused herself to be tied as she lay on the table, her arms crossed behind her back, and her legs flexed to their fullest extent, and, while six men struck her without ceasing, a seventh choked her. After this she remained insensible for some time, and her tongue, inflamed and discoloured, hung far out of her mouth. Another insisted upon receiving a hundred blows upon the abdomen with a hand-iron, and these were so heavy that they shook the wall against which she was placed, and upon one occasion a breach in it was caused at the twenty-fifth blow.

A physician, hearing of these things, insisted that they could not be true, as it was physically impossible that the skin, the flesh, the bones and the internal organs, could resist such violence. He was

[1] Quoted by Hammond, op. cit.

told to come and verify the facts. He hastened to do so, and, scarcely believing his eyes, he begged to be allowed to administer the blows. A strong iron instrument, sharp at one end, was put into his hands; he struck with all his might and thrust it deep into the flesh, but the victim laughed at his efforts, and remarked that his blows only did her good.

Besides these, Dr Hammond relates some cases of his own experience. A young woman, a patient in the wards of the Pennsylvania Hospital, began a series of movements, which consisted in bending her body backwards till it formed an arch, her heels and head alone resting on the bed, and then suddenly straightening herself out, she would fall heavily. Instantly the arch was formed again; again she fell; and this process was kept up with inconceivable rapidity for several hours every day. In another instance, a lady, during an attack of hysterical paroxysms to which she was liable, beat her head with such violence against a lath and plaster partition, that she made a hole in it, while little or no injury was inflicted on herself. In another, a girl, eighteen years of age, lay down on the floor and made all the members of her family stand on her in turn. A lady, in order that she might resemble those martyrs who suffered on the rack, tied her wrists with a stout cord, mounted a step-ladder, fastened the cord to a hook in the wall, and jumping from the ladder succeeded in dislocat-

ing her shoulder. Another lady rigidly closed her mouth, and refused to open it either to take food or to speak for over forty-eight hours. No force, that it was safe to use, could overcome the contraction of her muscles, and no persuasion induce her to relax them. She only yielded to an irresistible impulse to talk, and to a degree of hunger that human nature could no longer endure.

In the sixteenth and seventeenth centuries several convents in Europe were afflicted with an epidemic of hysteria. Such a disease is greatly increased by virtue of the imitative faculty, and many nuns were suffering from fearful convulsions and cataleptic paroxysms. The nuns of Loudon are a notable case. In these times "demoniacal possession" was believed to be of not infrequent occurrence, and, in fact, many of the nuns in their hysterical attacks accused persons of bewitching them.

The nature of the phenomena is shown in a series of curious questions put to the University of Montpellier by Fr. Santerre.

1. Whether the bending, bowing, and removing of the body, the head touching sometimes the soles of the feet, with other contortions and strange postures, are a good sign of possession ?
2. Whether the quickness of the motion of the head forwards and backwards, bringing it to the back and the breast, be an infallible mark of possession ?

3. Whether a sudden swelling of the tongue, the throat, and the face, and the sudden alteration of the colour, are certain marks of possession ?
4. Whether dulness and senselessness, or the privation of sense, even to be pinched and pricked without complaining, without stirring, and even without changing colour, are certain marks of possession ?
5. Whether the immobility of the whole body which happens to the pretended possessed, by the command of their exorcists during and in the middle of the strongest agitations, be a certain sign of a truly diabolical possession ?
6. Whether the yelping or barking like that of a dog, in the breast rather than in the throat, be a mark of possession ?
7. Whether a fixed, steady look upon some object, without moving the eye on either side, be a good mark of possession ?
8. Whether the answers that the pretended possessed made in French, to some questions that are put to them in Latin, are a good mark of possession ?
9. Whether to vomit such things as people have swallowed be a sign of possession ?
10. Whether the prickings of a lancet upon divers parts of the body, without blood issuing thence, are a certain mark of possession ?

In addition to these cases on the Continent, a similar form of hysteria was prevalent in America, instances of which Hammond records. They, however, did not last long. Mather writes that "Experiencc showed that the more these were apprehcnded the more were still afflicted by Satan, and the number of confessions increasing did but increase the number of the accused; and the executing of some made way for the apprehcnding of others. For still the afflicted complained of being tormentcd by new objects, as the former were removed. So that those who were concerned grew amazed at the number and quality of the persons accused, and feared that Satan by his wilcs had cnwrapped innocent persons under the imputation of that crime; and at last it was evidently seen that there must be a stop put, or the generation of the childrcn of God would fall under that condemnation. Henceforth, therefore, the juries generally acquitted such as were tried, fearing they had gone too far before, and Sir William Phips, the governor, reprieved all that were condemned, even the confcssors as well as others."

The striking fact is, that, in the majority of these cases, the mental faculties are in other ways unimpaired. Many of these epileptics and convulsionaires were cven brilliant in their gifts and convcrsation. The altcrcd balance of inhibition explains this.

Slight rcferencc has alrcady bcen made to the

influence which powerful speakers or learned scholars may exert over the minds of those who are listening to them; such influence, so far from indicating any lack of power or strength in the hearer, may be an evidence of the hearer's fine perception and delicate taste. Indeed, without the constant interaction which is the result of human thought, life would be nothing beyond existence. The suggestion, however, often hidden under this power or influence, may frequently bear with such force on persons as to entirely overcome the restraining action. They become imbued with an idea, which is the ruling passion, and no exterior circumstances can affect, or will be noticed, by them.

This state may occur in men and women of high mental calibre, and in fact is more likely to occur in such. It is no infrequent experience to hear persons say that, in listening to some performance of music or a drama at the theatre, for the time they quite "lost themselves," and one has only to watch their countenance at such a time to find its conclusive verification. External circumstances have lost all hold of them. They are entirely dominated by the idea which has been presented to them; external consciousness is absent, and, often shaking, or some other more or less violent means, has to be resorted to in order to bring them back, once more, into touch with the outer world. One has only to study many of the convulsive religious movements to notice this influence

exerted to such an extent that the devotees are absolutely beyond all reason and control. In India it is well known that there are many sects who, by the practice of strange arts, reduce themselves to conditions in which they are able to perform feats that fill the onlooker with amazement. The Fakirs and others have filled the spectator with wonder and awe by many of their performances; though, by the testimony of critical observers, it seems as if with regard to the Fakir, the human tendency to exaggerate is responsible for some of the tales told of them. The Aïssouans are a powerful religious sect in Morocco, and some of them were to be seen performing in London recently.

"These Aïssouans bring on themselves a sort of delirium by dances and the repetition of special litanies chanted in chorus and by inhaling perfumes of a particular quality, the whole being accompanied by music of a strange and weird character. At first they all sit round, looking grave and with an air of thorough conviction. Each Aïssouan performs in his turn; and then after a harum-scarum dance, without rhyme or rhythm, followed by disorderly leaps and bounds, they all howl and the music ceases. Each actor seems to feel a divine inspiration, and to be ready to dare and accomplish anything. These Aïssouans, one by one, exhibited such specimens as the above of the manners of their country, before a crowd of spectators. One of them might be seen eating the thorny, leathery leaves of

the cactus; another piercing his cheeks, tongue, neck, and arms, with long thick iron needles attached to heavy balls; another would greedily devour scorpions and live snakes; another would crack with his teeth, apparently with great gusto, sharp fragments of glass; a head man of the tribe licked a red-hot shovel and forced his eye out of its socket —and all this was repeated over and over again.

"The Aïssouan will tear and lacerate his skin, scarcely making the blood run, and, while thus torturing himself, he will leap, bound, howl, and then salute his companions on the forehead and sit down gravely. He will let his stomach be pierced with long nails driven in with a mallet by one of his co-religionists; and not content with crunching glass with his jaws, and devouring it, he will swallow whole pebbles, devour living vipers, or make them bite with undisguised satisfaction."[1]

These, however, are probably forms of hypnosis induced by the fatigue or the drugs they inhale. Tuckey says that they are hypnotised by their priest before the performance.

There are many instances in modern times, in England, of the power of unhealthy suggestion on persons of morbid intellect. In this connection the diary of Wesley is interesting.[2]

There are many subtle forms of suggestion which have not been touched in this chapter, but which

[1] Foveau de Courmelles. "Hypnotism," p. 169.
[2] See Appendix. Note III.

are curious and interesting as examples of its action in the normal and perfectly healthy waking state. Dr Ochorowicz[1] relates an experiment which is interesting.

"My friend P., a man no less absent-minded than he is keen of intellect, was playing chess in a neighbouring room. Others of us were talking near the door. I had made the remark that it was my friend's habit, when he paid closest attention to the game, to whistle an air from 'Madame Angot.' I was about to accompany him by beating time on the table; but this time he whistled something else—the march from 'Le Prophète.'

"'Listen,' said I to my associates; 'we are going to play a trick upon P. We will mentally order him to pass from "Le Prophète" to "La Fille de Madame Angot."'

"First I began to drum the march; then, profiting by some notes common to both, I passed quickly to the quicker and more *staccato* measure of my friend's favourite air. P. on his part also suddenly changed the air, and began to whistle 'Madame Angot.' Everyone burst out laughing. My friend was too much absorbed in a check to the queen to notice anything. 'Let us begin again,' said I, 'and go back to "Le Prophète."'

"And straightway we had Meyerbeer once more with a special fugue."

In the same way we could select almost innumer-

[1] "Mental Suggestion," p. 20.

able instances of the varieties of nervous action, altered in a greater or less degree by the especial circumstances of the moment; but in all these conditions we have a more or less incomplete illustration of the results due to an excess of action in certain neuronic groups, concomitant with a deficiency of action in other groups. Moreover, we are able in each case to accurately classify the condition in a definitely scientific manner by carefully studying the phenomena and examining the precise alterations present; but this is beyond our present scope, and we have sought simply to briefly describe some of the more interesting phenomena produced by a more or less spontaneous alteration in the relative balance of the nervous functions.

CHAPTER VI

THE DANGER AND THE USE OF HYPNOTISM

The playwright and novelist—The medical attacks—The possibilities of crime—Criminal assault—Seduction—False accusations — Differential criteria — Precautions — Other crimes—Criminal suggestion—Probabilities of success—Difficulties attending its execution—Diagnostic characters of act—Bernheim's rules—The restriction of performances—The medical application of hypnosis.

In considering the dangers to which the public are liable from an improper use of hypnosis, we must dismiss from our minds, as far as possible, the popular ideas with regard to the subject. The playwright and the novelist have both apparently been at pains to write the greatest amount of nonsense in the shortest possible space, and they have been at liberty to write with no knowledge and little understanding, since the public who listen to and read their productions care little, and know less. It would be a waste of time to discuss the various fallacies which underlie this class of writing; suffice it to say that no work of this character, with which the writer is acquainted, gives any true idea of the hypnotic state or the dangers which may attend its use. The members of the medical profession who have attacked the use of hypnotism

have shown very little acquaintance with the subject; their views appear to be religious rather than scientific, and it is unnecessary to discuss opinions which are not based on scientific observation. In consequence, however, of the unwise methods of criticism adopted, some of the real dangers attending the illicit use of hypnotism have been overlooked.

These dangers we proceed to discuss. And the relation of hypnotism to crime has to be considered, because, as we have seen in the earlier portion of this book, some persons are so deeply influenced that they become entirely obedient to the hypnotist. They are absolutely insensible to pain, and on waking cannot remember anything that may have happened in hypnosis. It is clear that such a state presents possibilities of crime, but it is to be remembered that according to all the observations of Liébeault, Bernheim, and others, only about fifteen per cent. of subjects are influenced to this deep degree. Nevertheless, however small the number, the fact that it is possible for a criminal action to be proposed or a criminal suggestion made with success, justifies a consideration of the matter.

This question of the criminal use of hypnotism recently came before the public in the "Gouffé murder trial." Gabrielle Bompard, as is well known, set up the defence that her part in the tragedy was due to post-hypnotic suggestions given to her by her paramour, Michel Eyraud. A large amount of evidence was called on both sides, but the jury

refused to accept the defence put forward, and returned a verdict of guilty.

Then there is the liability to assault, a possibility which, in the case of female subjects, is obviously of the greatest possible importance. Several cases, where a criminal assault has been committed, have been reported in various countries. The patient being in a deep stage and, on waking, having no memory of what has occurred, the opportunity for assault is unquestionable; moreover, as further suggestions may be made to the woman by the hypnotist with the object of preventing his detection, the woman herself may have no knowledge of her condition and may be quite unable to account for the pregnancy that may ensue; or, when pregnant, she may carry out a post-hypnotic suggestion and attribute the paternity to an innocent person. Leaving out of consideration the deeper stages in which an assault is primarily to be dealt with, many of the lighter stages give the hypnotist the opportunity of making suggestions which, if skilfully given, might easily diminish the resistance of the subject to vanishing point, especially if the subject be a woman not requiring too much persuasion. By these means, also, the consent of the subject might be gained after hypnosis, as a result of the suggestions given in hypnosis. It is to this class that most of the cases in the future will probably belong; for, in the deeper stages, the man runs some risk; the patient may wake up in the same way as some

subjects do when a suggestion is made which violently offends some strong innate feeling (*e.g.*, a suggestion to a Catholic that he should be a Protestant); and for various reasons, the condition of the woman, etc., he would not be likely to choose the actual deep hypnosis as the moment for assault. On the other hand, where, by suggestion, he has obtained consent, he runs no apparent risk and more effectually gains his purpose. Further, it is relation with this class that false accusations may be made; the seduction being admitted, it may be said by the woman that she was induced to consent after she had first been hypnotised by the man. Such a statement may be quite false, but it may be quite true, and no ordinary tribunal could come to any scientific conclusion on such a matter as this by the ordinary methods of examination; but by carefully examining the statements of the woman, by possibly hypnotising the woman to see how far hypnosis is inducible and to what extent suggestion is effectual, and by considering all the circumstances we may in many cases arrive at a definite and certain opinion. Not, indeed, that the subject may not lie in hypnosis; such an idea has no foundation in fact, and falsehood may be more elaborate and detailed than in the normal state. Moreover, though the hypnosis may be genuine, there may be simulation in the hypnosis, if suggestions have been given to that effect; but all these questions and many others could easily be

settled by one well acquainted with the possibilities of simulation and the phenomena of hypnosis. With regard to the precautions to be adopted the remedy is easy, and should be put in force by the operator for the sake of his own responsibility, and by the subject for her safety and confidence. Dr Kingsbury sums this up well by saying, "No person should permit himself or herself to be hypnotised save by a medical man (or properly authorised scientist) who has a character to maintain, and in whose integrity and ability confidence can be reposed. And further, no woman should allow herself to be hypnotised except in the presence of one or more witnesses of whom she approves." [1]

Other crimes may be committed against the hypnotised individual; it would be comparatively easy for the hypnotist to kill his subject, with no lesion to be found *post-mortem*. In good subjects, the heart-beat can be modified to a remarkable degree by suggestion, and a continuation of skilful suggestion might produce a fatal syncope. Again, suggestions may be made by the hypnotist in his own interest against that of the subject. The subject may be induced to make a will, draw cheques, and perform other actions to the advantage of the hypnotist. Moll performed an experiment which seems to show the probability of success in some cases. He hypnotised a man and suggested to him that he should afterwards write and promise a

[1] "The Practice of Hypnotic Suggestion," p. 119.

donation to the Society of Prussian Medical Officers, and at the same time explain (according to the suggestion) that this offer was made quite of his own accord. This suggestion was carried out.

The possibilities of criminal suggestion have been elaborately discussed by many writers, prominent amongst whom are Liégeois, Gilles de la Tourette, and Forel. It is admitted by all that even amongst deep subjects, the proportion who would commit a crime in response to suggestion is very small. For not only will the subject refuse to commit a crime, but it has been often noticed that any suggestion, which is repulsive to the feelings of the patient, will, in all probability, be disobeyed.

Liégeois narrates amongst many others the following case:—

"I dissolved a white powder in water, and solemnly declared to Madame C— (a patient aged thirty-five) that it was arsenic. I then said to her: 'Here is Monsieur D—, he is thirsty, he will ask you in a moment for something to drink; you will offer him this glass of water.' 'Yes, sir.' Monsieur D—, however, asked a question I had not foreseen, he asked what was in the glass. And with a candour that banished all idea of simulation, Madame C— replied: 'It is arsenic!' I was therefore obliged to correct my suggestion, and I said: 'If you are asked what the glass contains, you will say sugar and water.'

"Cross-questioned by the commissary of police,

Madame C— remembers absolutely nothing. She asserts that she has seen nothing, done nothing, and has not given anything to drink to anyone; she does not know what they mean."

Gilles de la Tourette records another experiment of criminal suggestion:—

"We first put H. E—, who has had some words with our friend B—, a medical student in the hospital, into a state of somnambulism, we then say to him: 'You know Monsieur B—?' 'Yes, sir.' 'He is a very nice man!' 'Oh no, sir, he does not attend to me properly!' 'Really! well then we must put him out of the way, and then we shall certainly have another student who will take better care of you.' 'I ask for nothing better.' 'You must do what is necessary; here is a pistol (and we place a ruler in his hand); when you awake, you will fire at him, he will be coming here, wait for him!'

"We blow on H. E—'s eyes, who, after awaking, continues conversing with us, all the while playing with the revolver (or rather the ruler that represents a revolver in his eyes), which he absolutely refuses to part with. The suggestion not yet having been fulfilled, the subject would sooner kill anyone who tried to dispossess him of his weapon, rather than give it up.

"At a certain moment our friend B—, who has been warned of the way he will be greeted, enters the ward. H. E— allows him to approach, and then coolly discharges his pistol point blank at

him. B— falls down, exclaiming: 'I am killed!' 'What,' we say to H. E—, 'you have killed Monsieur B—! but what can have induced you to commit such a crime?' 'Monsieur B— did not properly attend to me; I have revenged myself!' 'That is not a sufficient reason.' 'You may think so, but I had also many others; besides, he was doomed to die by my hand!'"

The experimental nature of these suggestions would probably act as a suggestion in itself in these cases, and it is difficult to decide how far these interesting experiments represent what would occur in actual life. At any rate the following description by Luys in one of his clinical lectures is much exaggerated: —"You can not only oblige this defenceless being, who is incapable of opposing the slightest resistance, to give from hand to hand anything you may choose, but you can also make him sign a promise, draw up a bill of exchange, or any other kind of agreement. You may make him write an holographic will (which according to French law would be valid), which he will hand over to you, and of which he will *never know the existence.* He is ready to fulfil the minutest legal formalities, and will do so with a calm, serene, and natural manner calculated to deceive the most expert law officers. The somnambulists will not hesitate either, you may be sure, to make a denunciation, or to bear false witness; they are, I repeat, the passive instruments of your will. For instance, take E—:

she will at my bidding write out and sign a donation of forty pounds in my favour. In a criminal point of view, the subject under certain suggestions will make false denunciations, accuse this or that person, and maintain with the greatest assurance that he has assisted at an imaginary crime. I will recall to your mind those scenes of fictitious assassination which I have exhibited before you.

"I was careful to place in the subject's hand a piece of paper instead of a dagger or a revolver; but it is evident, that if they had held veritable murderous instruments, the scene might have had a tragic ending."

Without denying the possibilities of successful criminal suggestion, we must admit that there are a great many hindrances to its successful execution, for many generally incalculable circumstances will have to be taken into consideration by the hypnotist. If the subject execute the suggestion as a result of suggested revenge or other passion, he will know that it is wrong and against the law, so that to the execution of the crime there will be opposed his moral consciousness; the result of this conflict manifests itself in many ways in experiments of much less serious moment; thus, if the subject is told that he will strike some one on waking, he will do what has been suggested, but he will not hurt the individual struck; not because he is in any way "acting," but because he is the subject of two conflicting emotions, each of which is acting on him with a definite force. Then if these diffi-

culties be provided for, the hypnotist will probably involve himself; suggestions being made to counteract strong feelings naturally existent in the man, they will fail to effect their purpose, since the inhibition of these centres will be disturbed, causing the suggestion to be partly dissipated in consciousness, and this, despite the attempts of the hypnotist, will bring consideration and resistance into play. Finally, if all the suggestion be effective, the subject will probably perform the act in a condition of post-hypnosis, resembling the second or fourth post-hypnotic condition. The actions of the subject immediately after the act would be of a character to indicate the solution of the question, and would probably result in an immediate search for the hypnotist. So that on the whole we are inclined to think a criminal act against the subject is more easy than to obtain the proper execution of a criminal suggestion against another.

Still, in the hands of a skilful hypnotist, it would be difficult to place any definite limitations on the reaction of the subject to suggestion. He might be induced to commit suicide, to desert his wife, and to do many other things where, by the effect of the suggestion on the man's mind, these results might naturally, and more or less indirectly, be produced. It is important that everyone should recognise that the dangers of hypnotism in the hands of the ignorant, the unscrupulous, or the malicious, are real; and though it would be idle to

attack hypnotism itself, because like everything else it is open to abuse, yet the public have a right to demand that they should have some guarantee that the qualifications of the hypnotist and his good faith are unquestionable.

Bernheim, writing as a physician on the therapeutic side of hypnotism, lays down the following rules [1] :—

1. "Never hypnotise any subject without his formal consent, or the consent of those in authority over him.

2. "Never induce sleep except in the presence of a third person in authority, who can guarantee the good faith of the hypnotist and the subject. Thus any trouble may be avoided in the event of an accusation, or any suspicion of an attempt which is not for the relief of the subject.

3. "Never give to the hypnotised subject, without his consent, any other suggestions than those necessary for his case. The physician has no rights but those conferred upon him by the patient. He should limit himself to the therapeutic suggestion ; any other experiment is forbidden him, without the formal consent of the patient, even if it be in the interest of science. The physician should not profit by his authority over the patient in order to provoke this consent, if he think that the experiment which he wishes to perform may have the slightest harmful effect."

Both for the sake of science and for the sake of the public good, it is imperative that proper re-

[1] Op. cit., p. 416.

strictions should be placed on the use of hypnotism. Great Britain is one of the few countries permitting the public exhibition of hypnotised subjects for the purposes of entertainment; for these vulgar shows and degrading exhibitions there can be no excuse, and it is inexcusable that they have been so long tolerated.

It would be surprising if a state in which such modifications of the organism can be induced, could not be of service from a therapeutic point of view, and many members of the medical profession in this and other countries have sought its aid in the treatment of disease. For many years Liébeault had used hypnotism in his practice at Nancy, but it did not become widely known until Bernheim, Professor of Clinical Medicine at the College of Medicine, Nancy, was induced to investigate the subject. From this time Bernheim became the most prominent advocate of its use in medicine, and his work, "Suggestive Therapeutics," is the most important contribution made to the study of this branch of the subject. The application of hypnosis in medicine has gradually extended, and many are using it in the various countries. In England, Lloyd Tuckey was the first, in recent years, to advocate the use of hypnotism in the treatment of disease, and his work on "Psycho-Therapeutics" may be consulted by those desirous of knowing more in this connection. Milne Bramwell and Kingsbury have also done much valuable work. Felkin published in 1890 a table, an adaptation of

which follows; without committing ourselves to the details, it is interesting as showing that the subject has been much studied, and that a large number of cases have been recorded from which to draw conclusions:—

	No. of Cases.	Cured.	Improved.	Failed.
Organic Diseases of the Nervous System,	10 B.	7 B.	2 B.	1 B.
	24 R.	1 R.	13 R.	10 R.
	1 T.	1 T.	...	...
Hysterical Diseases,	17 B.	16 B.	...	1 B.
	36 R.	9 R.	24 R.	3 R.
Neuropathic Affections,	18 B.	17 B.	1 B.	...
	145 R.	47 R.	76 R.	22 R.
	1 W.	1 W.	...	...
	1 T.	1 T.	...	...
Various Neuroses,	15 B.	14 B.	1 B.	...
	4 T.	4 T.	...	...
Dynamic Pareses and Paralyses,	3 B.	3 B.	...	...
	1 T.	1 T.	...	...
Gastro-intestinal Affections,	4 B.	1 B.	3 B.	...
	1 T.	1 T.	...	...
Various Painful Affections,	12 B.	12 B.	...	...
	15 R.	2 R.	6 R.	7 R.
	2 T.	2 T.	...	...
Rheumatic Affections,	19 B.	17 B.	2 B.	...
	23 R.	7 R.	14 R.	2 R.
Neuralgias,	5 B.	4 B.	1 B.	...
	57 R.	17 R.	30 R.	10 R.
Amenorrhœa,	13 V.	13 V.	...	...
Dysmenorrhœa,	6 V.	6 V.	...	...
	1 T.	1 T.	...	...
Menorrhagia,	8 V.	8 V.	...	...
	1 F.	1 F.	...	...
Mental Diseases,	53 R.	10 R.	27 R.	16 R.
Totals,	496	224	200	72

B., Bernheim: R., Van Renterghem and Van Eeden; T., Tuckey; W., Wagner; V., Various authors.

The therapeutic applications of hypnotism have an important bearing on physiological psychology; and the effects obtained by its use go far to prove the absolute manner in which the course of a suggestion is altered as a consequence of hypnosis. As an instance of stimuli essentially psychical in their character becoming, as a result of hypnosis, physical in terminal dissipation, we may quote a case of Tuckey's, which is as interesting from this as from the medical point of view.

A. N——, clerk, aged 25, came under treatment in March, 1889. She had had much writing to do, and since three years had felt symptoms of loss of power in the right hand and control over the pen. She had been treated at a general hospital by galvanism for three months without benefit, and had become so much worse that she had been obliged to leave the desk and engage in other occupations. She was also unable to use the needle for any length of time on account of cramp supervening. After writing two or three lines, she experienced crampy pains in the thumb and forefinger and in the flexor muscles of the forearm. After a few lines, spasmodic jerking of the thumb was observed, and this increased—together with the pains—to such an extent, that in less than a minute the patient declared her inability to hold the pen any longer. There was marked tenderness and soreness on pressure over the median and musculo-spiral nerves. She was hypnotised, and

fell into the third stage. In that condition the muscles were rubbed, the joints exercised, and suggestions of improvement made.

After a few minutes' rest the patient was directed to again write, and she found the fatigue and cramp had disappeared and did not return until she had written half a page. She came regularly for treatment three times a week for two months, and at the end of that time was cured.

The cases where the fault lies in the higher neuronic groups show the course of a stimulus, which, though not provoking consciousness, is yet directed to the more psychical elements of the neuronic groups, in accordance with the principles laid down in our discussion of the physiology of hypnosis. The following case quoted from Tuckey is of interest in this respect :—

Dr X—— is a university professor of eminence, and he came to me in June 1890, to try what hypnotic suggestion would do to cure him of smoking. He had been an inveterate smoker for twenty years, and had never succeeded in breaking himself of the habit, though he had made frequent attempts. He was highly nervous, and complained of sleeplessness, palpitation, mental irritability, and dyspepsia — all probably due to the very large quantity of tobacco he was consuming in the form of cigarettes. He was easily hypnotised, and fell into the second stage. I suggested that he would cease to care for tobacco, and that he would find

himself able to break off the habit without difficulty. The operation was repeated daily for three days, and the patient then discontinued treatment. On making inquiries I have received a letter from him from which the following is an extract:

"The suggestion was immediate in its effect, so that I felt no craving for the weed, although I had been a habitual smoker for nearly twenty years. Of course I felt very uncomfortable, and my life was very much upset at first by my sudden change in habit; nor did I experience at once all the benefits that I expected from abstinence; so that had I not been under influence I should certainly have relapsed (to my everlasting regret), as I had done whenever I relinquished the habit before being hypnotised. I begin to think that I must now be tobacco-proof, and have not smoked once since I saw you, and am in very much better health."

It is not the object of this work to specifically deal with the medical aspects of the question, and those who wish to obtain further information are referred to the works on this branch. But we may express the opinion that whilst hypnotism will probably continue to be of great value in the hands of medical men who understand the subject, it is not likely to be of much service if made use of by members of the medical profession who have only a slight acquaintance with its practical side; many failures have occurred through the incompetence of the operator. Moreover, it is hardly likely to be

of great service in general hospital practice. Those who are acquainted with the general conditions existent in hospital wards, with the constant ingoing and outgoing of persons in the service of the hospital, and with the constant signs of the work of the ward in progress, will realise how difficult it would be to obtain the conditions laid down as generally necessary for the induction of a first hypnosis; nevertheless, given the proper conditions and a skilful operator, the application of hypnotism as an auxiliary treatment would probably be beneficial. The uses of hypnosis in the study of physiological psychology are sufficiently evident in the previous chapters.

CHAPTER VII

THE "TRANSFER" EXPERIMENTS

A LARGE amount of public attention has been directed at one time and another to some "hypnotic" experiments connected with La Charité Hospital, Paris, of which Dr Luys is the physician. Dr Luys himself first put these theories before English readers in two articles in the *Fortnightly Review* for June and August 1890, entitled, "The Recent Discoveries in Hypnotism." By this curious method the patient himself is not sent to sleep, but another is hypnotised, and then by means of a magnet the disease is "transferred" from the patient who is awake to the hypnotised subject who before she is awakened is freed by suggestion from the effects. This idea is by no means a "discovery," for, many years ago, something very similar was a favourite doctrine of the mesmerists, who found, according to their accounts, that, when the patients were mesmerised, their pains were experienced for a time by the mesmerist.

The influence of the magnet in the curing of disease was firmly believed in by many of the ancients. Hippocrates strongly advocated its use, and there are tomes of mediæval lore concerning

the magnetic virtues (*Vide* Kircher, Maxwell, and others). In 1845, Reichenbach published an elaborate account of the action of magnets on the human organism; so that, altogether, Dr Luys' "discoveries" were somewhat ancient.

However, despite the fact that the main theory of Dr Luys is almost as old as the hills, it may be well to examine his experiments.

Luys tells us that "This new method of therapeutics consists in the transference of the nervous state of a diseased subject, to a subject hypnotised, by means of a magnetic rod." (*A* is the patient wide awake.) "*A* lays his hands on those of the sleeping subject, and an assistant, holding a big magnetised rod with three branches, moves it for a minute or two in front of the arms of the two persons placed before him. He follows the lines of the limbs, forming thus a circuit of continuous magnetisation, and, at the same time, he takes good care only to work with the north pole (this is of vital importance) when he stops at the painful places pointed out by the patient."

Not only will the hypnotised subject take the disease of the patient, but also the personality, so that when a female subject is sitting for a male patient she will assume a masculine voice and carriage, and will complain of the beard being pulled if her face be touched. A few facts concerning these strange methods may serve to show the probable explanation.

1. The subjects are all hysterical.
2. The same set of subjects are in daily attendance at the laboratory.
3. They are paid by the patients whose ailments they are supposed to take, and they attend solely for the sake of these gratuities.
4. They are always about the laboratory, so that they can see exactly what is expected of them by seeing the other transfer operations.
5. All these subjects regularly read the history of the cases as published in the clinical reports of the hospital.
6. The ailment is *seen* to be adopted by the subject if it be an apparent one, such as paralysis; it is *assumed* to be transferred if it be not a visible complaint, such as heart-disease.
7. The patient, in many cases, does not appear to be any better when his transfer is effected. Thus a patient suffering from "paralysis agitans" may have his affection "transferred" to the subject, who will adopt the most violent palsy; but all this time the patient is suffering still.[1]

It is plain from these facts that the suffering of the subject is due to the suggestion made that he should suffer, whilst in the cases where the patient is really benefited the cause clearly lies in the effect which the sight of the subject undergoing

[1] *Vide* Kingsbury, op. cit., p. 147.

his or her suffering would necessarily have on a person of impressionable temperament and vivid imagination. Another of Luys' theories is that the magnet can produce emotional effects. The argument is, that as the north pole of a magnet attracts the needle, while the south repels it, so in human beings similar emotions are excited.

"If you present the *north* pole of a magnetic rod to a subject in a state of lethargy, you arouse in him movements of *joy* and expansion of feeling; and if you connect him with the *south* pole, movements of *repulsion* appear."

There might be some test in these experiments, since the subject, we might think, would be ignorant as to which was the north pole and which the south, and thus suggestion would be eliminated. Unfortunately, however, a large "N," almost an inch high, written in blue ink, was placed on the north pole.

The subjects are also supposed to see flames issuing from the magnet, of a beautiful *yellow* light from the *north* pole, and a *blue* light from the *south* pole.

Reichenbach's subjects found that the colours of the "odylic light" at the *north* pole were *blue*, and *yellow* at the *south*.

Many other experiments of Luys might be described, such, for instance, as the influence of drugs in sealed tubes, where by contact alone the appropriate reactions are brought about, brandy

producing intoxication, etc., etc; the explanation in all these cases is the same.

Transference of Sensation.—One class of experiments in La Charité have provided a great deal of "copy," of a cheap kind, for several newspapers. This consists in taking a glass of water or a doll, and then transferring the sensation of the subject to the water or the doll. In consequence of this "transference," if the water be touched or the doll pinched, the subject experiences the most acute agony, and groans until the water or the doll, as the case may be, is left alone. Here again suggestion is the explanation. The writer gave a demonstration of the fallacies of these experiments, and the following was the report:—"The subject was now introduced, and being thrown into the hypnotic state, the experiment was tried with complete success. Whenever the water was touched, *and the subject was aware of the fact*, he shuddered and writhed until the features became distorted as if with excessive pain. When, however, the water was touched and the patient was kept in ignorance of the fact, there was no effect whatever upon him." From time to time some one new to the subject is deceived, and a few days' sensation results; the indication of the fallacies in these experiments may be useful in showing the methods of examination necessary in similar cases.

CHAPTER VIII

HYPNOSIS IN ANIMALS

The hypnotisation of animals is possible to a very limited extent, and indeed it is not altogether accurate to term the condition induced, hypnosis; there is, of course, no receptivity to suggestion, and all we can obtain is a certain rigidity, so that the animal, bird, or reptile, will remain in any position in which it may be placed. Apparently the first one to notice this phenomenon was Daniel Schwenter, who in 1636 catalepsed a number of cocks and hens. Fr. Kircher (1646) was the first to make any scientific experiments on the subject. He took fowls, and having tied their legs together, placed them on the ground, and he then drew a chalk line from their beaks, with the result that the birds remained perfectly motionless. A hen can be made to sit or to transfer her nest by means of a well-known expedient. The head is placed under the wings, and the bird is then rocked gently to-and-fro, with the result that it apparently goes to sleep; on waking, the hen will remain contentedly in the nest on which she has been placed.

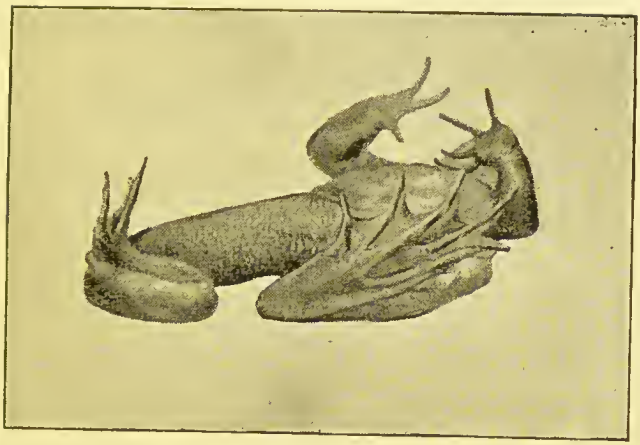

FIG. 13.—*Frog Catalepsed* (p. 263).

FIG. 14.—*Frog Catalepsed* (p. 263).

The Fakirs and the Aïssouans are reported to be able to fascinate the most venomous snakes, to charm them with music, and to induce them to imitate, as far as possible, their movements.

These tales require a great deal of sober corroboration before they can be regarded as of any value. It is well known that in most of the cases of the snake-charmers the fangs of the snakes have been extracted, or the snakes have not been venomous.

The catalepsy induced in animals by nerve stimulation has been compared to the fascination which it is said some animals can exercise over others. Of this fascination there can hardly be any doubt. The writer has frequently seen frogs and little birds fascinated by a snake; but it is by no means the rule. Out of a hundred frogs which were put into his snake case, only six were in any sense fascinated; the others jumped about madly till they were caught by the snakes.

It seems rash to compare this fascination, which may be the natural consequence of extreme fright, with the catalepsy induced by means of pressure on the nerves. Many such illustrations are given as analogous instances. It is not easy to catch a pigeon by going straight up to the bird, but it can be quickly taken by walking round and round it. The pigeon turns upon itself, so as not to lose sight of the person who is trying to catch it, and can soon be seized. This has been quoted as an hyp-

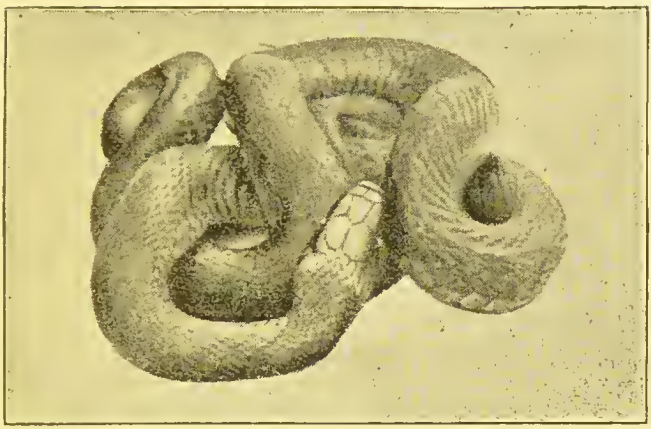

FIG. 15.—*Snake Catalepsed* (p. 263).

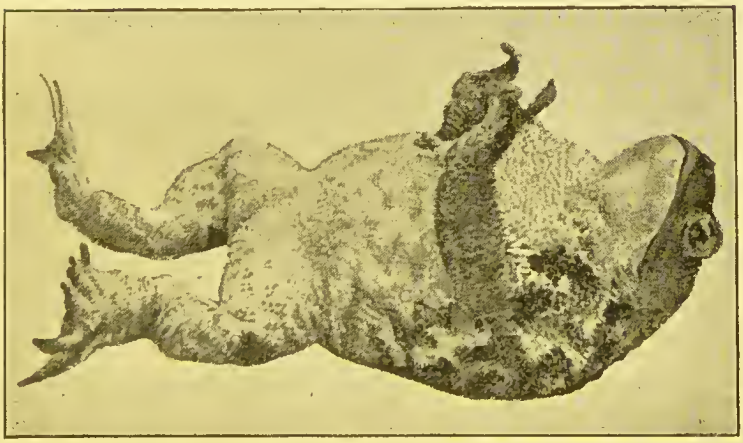

FIG. 16.—*Toad Catalepsed* (p. 263).

nosis. The obvious explanation seems to be that the bird becomes giddy and dazed.

Many animals may be rendered obedient and docile by means of the fixed look and movements that will tend to concentrate their attention. Even a tiger will seek to attack from behind, and thus avoid the look; most animals can be kept in check if they are not allowed to escape the vision of the person attacked.

A phenomenon which seems allied to the catalepsy induced by nerve stimulation is seen in the *simulated death* of many animals.

Insects of many kinds, spiders, crayfish, etc., fall into a state of complete insensibility the moment they are alarmed, but they recover directly the exciting cause of the alarm is removed (Romanes).

An interesting case of simulated death has been described amongst snakes, but whether this is really a case of simulation is disputed.

The cataleptic state is induced in animals either by the monotonous excitation of particular nerves, or by constant pressure. The operation, in some cases, is easy, in others, difficult; whilst in the case of larger animals it seems generally impossible, owing to the great resistance made at the outset.

By means of simple inhibition, resulting, probably, in a loss of sensory equilibrium, the writer cataleptsed cats (rarely), dogs (less rarely, but not often), pigeons, canaries, fowls, starlings, crayfish, frogs

(Figs. 13 and 14), snakes (Fig. 15), toads (Fig. 16), lizards (Fig. 17), slow-worms, etc., etc.

It is likely that, with instruments for applying the proper stimulation and pressure, catalepsy could be induced in the larger animals, such as the horse and the bullock.

Frogs and toads are easily catalepsed, and when the experiments are repeatedly performed on them

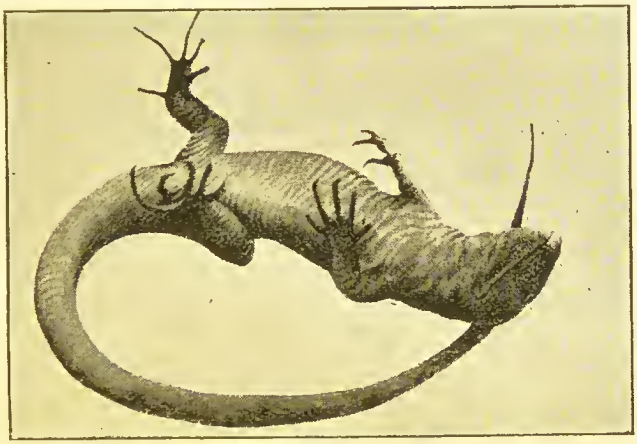

Fig. 17.—*Lizard Catalepsed.*

they may remain for long periods in this condition. The toad figured in the text could always be made to remain in this state for half an hour. The absence of some of the ordinary "reflex" acts is remarkable. Anyone acquainted with lizards will know the extreme rapidity with which they return to their feet on being put back downwards. The

movement is so rapid that the fingers leave the upturned back, and not the abdomen; this altered condition has some resemblance to the stage of acute passivity, which has been described in the chapter dealing with the induction of hypnosis; but, whilst an interesting subject in itself, the catalepsy of animals does not appear to throw much light on the hypnosis occurring in man.

APPENDIX

Note 1

The works of Father Athanasius Kircher cover an enormous ground. There has been founded in Rome a Museum named after him. The following is the title-page of his work, quoted on page 6 :—

"Athanasii Kircheri E. Soc. Jesu. Magneticum Naturae Regnum sive Disceptatio Physiologica de triplica in Natura rerum Magnete, iuxta triplicem eiusdem Naturae gradum digesto—Inanimato, Animato, Sensitivo, qua occultae prodigiosarum quarundam motionum vires et proprietates, quae in triplici Naturae Oeconomia nonnullis in corporibus noviter delectis observavantur, in apertam lucem eruuntur et luculentis argumentis, experientia duce, demonstrantur." 1667.

This work is divided into four sections :—

Sectio I. "De viribus Naturae in genere."
Sectio II. "De Magnetibus animalis."
Sectio III. "De Magnetibus in vegetabili Natura existentibus—sive de solisequis et lunisequis Magnetibus."
Sectio IV. "De Sensitivae Naturae Magnete."

Note 2

The following is the full title of William Maxwell's work :—

"De Medicina Magnetica Libri tres in quibus tam Theoria quam praxis continentur opus novum admirabile

et utilissimum ubi multa Naturae secretissima miracula panduntur spiritus vitalis operationes hactenus ineognitae revclantur, totiusque hujus seeretae artis fundamenta formissimis rationibus expcrientia fultis porruntur: philosophiae secretioris, studiosorum gratia, Auctore Guillelmo Maxvello, M.D. Seoto-Britano." 1679.

Somc of his ideas are very eurious.

He seeks to prove the following twelve conclusions:—

Conclusio 1. "Anima non solum in corpore proprio visibili, sed etiam extra corpus est, uec corpore organico circumscribitur."

Conclusio 2. "Anima extra corpus proprium, communiter sic dictum, opcratur."

Conclusio 3. "Ab omni corpore radii corporales fluunt, in quibus anima sua pracsentia operatur; hisque energiam et potentiam operandi largitur."

Conclusio 4. "Radii hi, qui ex animalium corporibus emittuntur, spiritu vitali gaudent, per quem animae operationes dispensantur."

Conclusio 5. "Excrementa eorporum animalium spiritus vitalis portionem rctinent; ideoque vita illis negando non est. Estque haee vita eiusdem cum vita animalis speciei sive ab eadem anima propagatur."

Conclusio 6. "Inter corpus et excrementa a eorpore procedentia, coneatenatio quaedam est spiritum sive radiorum, lieet excrementa longissime separentur, partium eorporis separeturum, sicut et sanguinis eadem prorsus est ratio."

Conclusio 7. "Vitalitas haec tam diu durat, quam diu excrementa, sive partes separatae, vel sanguinis in aliud diversae spcciei commutatus non fuerit."

Conclusio 8. "Una parte corporis affecta, sive spiritu laeso, morbida compatiuntur reliqua."

Conclusio 9. "Si spiritus vitalis in aliqua parte fortificatus fuerit, fortificatur illa ipsa actione in toto corpore."

Conclusio 10. "Ubi magis nudus est spiritus ibi citius afficitur."

Conclusio 11. "In excrementis, sanguine, etc., non tam immersus est spiritus quam in corpore, ideoque in his citius afficitur."

Conclusio 12. "Commixtio spirituum efficit compassionem a compassione illa ortum ducit."

Note 3

The following extract from the diary of Wesley gives an account of a religious meeting :—

"Sunday, May 20. Being with Mr B—ll at Everton, I was much fatigued and did not rise, but Mrs B— did, and observed many fainting and crying out while Mr Beveridge was preaching; afterwards, at church, I heard many cry out, especially children, whose agonies were amazing; one of the oldest, a girl of ten or twelve years old, was full in my view, in violent contortions of body, and weeping aloud, I think, incessantly during the whole service, and several much younger children were in Mr B—ll's full view, agonising as they did. The church was equally crowded in the afternoon, the windows being filled within and without, and even the outside of the pulpit to the very top, so that Mr B— seemed almost stifled with their breathing, yet, feeble and sickly as he is, he was continually strengthened, and his voice, for the most part, distinguishable in the midst of all the outcries. I believe there were present three times more men than

women, a greater part of whom came from afar; thirty of them having set out at two in the morning, from a place thirteen miles off. The text was:—'Having a form of godliness, but denying the power thereof.' When the power of religion began to be spoken of, the presence of God really filled the place; and while poor sinners felt the sentence of death in their souls, what sounds of distress did I hear! The greatest number of those who cried or fell were men; but some women and several children felt the power of the same Almighty Spirit, and seemed just sinking into hell. This occasioned a mixture of various sounds; some shrieking, some roaring aloud. The most general was a loud breathing like that of people half-strangled and gasping for life; and indeed, almost all the cries were like those of human creatures dying in bitter anguish. Great numbers wept without any noise; others fell down as dead; some sinking in silence; some with extreme noise and agitation. I stood on the pew seat, as did a young man on the opposite pew, an able-bodied, fresh, healthy countryman; but in a moment, while he seemed to think of nothing less, down he dropped with a violence inconceivable. The adjoining pew seemed to shake with his fall. I heard afterwards the stamping of his feet; ready to break the boards as he lay in strong convulsions at the bottom of the pew. Among several that were struck down in the next pew was a girl who was as violently seized as he. When he fell, Mr B—ll and I felt our souls thrilled with a momentary dread; as when one man is killed with a cannon-ball another often feels the wind of it.

"Among the children who felt the arrows of the Almighty, I saw a sturdy boy, about eight years old, who

roared above his fellows, and seemed, in his agony, to struggle with the strength of a grown man. His face was red as scarlet, and almost all on whom God laid His hand, turned either very red or almost black. When I returned, after a little walk, to Mr Beveridge's house, I found it full of people. He was fatigued, but said he would nevertheless give them a word of exhortation. I stayed in the next room, and saw the girl whom I had observed so peculiarly distressed in the church lying on the floor as one dead, but without any ghastliness in her face. In a few minutes we were informed of a woman filled with peace and joy, who was crying out just before. She had come thirteen miles, and is the same person who dreamed Mr B— would come to her village on that day whereon he did come, though without either knowing the place or the way to it. She was convinced at that time. Just as we heard of her deliverance, the girl on the floor began to stir. She was then set on a chair, and, after sighing awhile, suddenly rose up rejoicing in God. Her face was covered with the most beautiful smile I ever saw. She frequently fell on her knees, but was generally running to and fro, speaking these and the like words: 'Oh, what can Jesus do for lost sinners? He has forgiven all my sins! I am in heaven! I am in heaven! Oh, how He loves *me*! And how I love Him.' Meantime I saw a thin, pale girl, weeping with sorrow for herself and joy for her companion. Quickly the smiles of heaven came likewise on her, and her praises joined with those of the other. I also then laughed with extreme joy, so did Mr B—ll (who said it was more than he could well bear). So did all who knew the Lord, and some of those who were waiting for salvation, till the cries of those who were struck

with the arrows of eonviction were almost lost in the sounds of joy. . . . Immediately after a stranger, well-dressed, who stood faeing me, fell baekward to the wall; then forward on his knees, wringing his hands, and roaring like a bull. His faee at first turned quite red, and then almost blaek. He rose and ran against the wall, till Mr Keeling and another held him. He screamed out, 'Oh, what shall I do, what shall I do? Oh, for one drop of the blood of Christ!' As he spoke, God set his soul at liberty; he knew his sins were blotted out; and the raptures he was in seemed too great for human nature to bear. He had come forty miles to hear Mr B—ll, and was to leave the next morning; which he did with a glad heart, telling all who eame in his way what God had done for his soul. . . . And now did I see sueh a sight as I do not expeet again on this side eternity. The faees of the three justified ehildren, and I think of all the believers present, did really shine; and sueh a beauty, such a look of extreme happiness, and, at the same time, of divine love and simplieity, did I never see in human faees till now. The newly justified eagerly embraeed one another, weeping on eaeh others' necks for joy. Then they saluted all of their own sex, and besought men and women to help them in praising God."

Another eurious instanee of the suspension of the rational centres is to be found in "Shakerism." Mother Ann (the presiding genius of the order) is supposed to have a splendid vineyard; the walks are of pure gold, with angels walking around among the vines. There are ten thousand kinds of grapes. Mother Ann superintends her own wine press, and often brings wine ("spiritual") as a present. The visionist pretends to take a waiter

filled with wine-glasses; everybody must have faith, and take one as it is handed to him. Those who have little or no faith are told by the visionist whether they have taken theirs. Then they all raise their hands to their lips as in the act of drinking, and presently they begin to reel and stagger round the room as though actually drunk. Indeed, they act in all respects as drunken persons, stamping, shaking, vomiting, etc., till, finally exhausted, they gradually sink away till all is silent. Then, standing in a circle, they throw their handkerchiefs over their shoulders, raise their hands to their heads, and make six solemn bows, saying with each, "I kindly thank Mother for this beautiful gift." A gift, sometimes called the "mortification gift," enters the room. The inspired immediately begin slapping their hands against their sides, and crowing in imitation of a chicken cock. Some will cackle, others imitate the turkey, duck, hen, goose, or guinea-fowl.

Sometimes young men and women are exercised by what they call the "jerks" for two weeks at a time, during the whole of which period the head is kept in continual motion by quick convulsive motions of the shoulders and neck. One young woman who had been "jerked" for three weeks had her face frightfully swollen, and her eyes dilated and bloodshot.

Directly after the "jerks" she began to talk in unknown tongues, and continued, at short intervals, for three or four days; then she stopped suddenly and remained entirely mute for two weeks, no possible persuasion being sufficient to make her say even "yes" or "no." This experience is called the "dumb devils." [1]

[1] Hammond, op. cit., p. 243 *et seq.*

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